



StatSoft Power Solutions®

From StatSoft – the worldwide leader in advanced process monitoring and optimization software systems and predictive data mining applications

Optimize Combustion, OFA

Cyclone, Wall-Fired, T-Fired;
robust flame temperatures;
primary, secondary, tertiary air values

Stabilize Operations

Avoid uncontrolled emissions, excursions,
expensive downtime, generation rollbacks

Reduce Emissions

NO_x, CO, LOI

Predict Problems

Emissions related to combustion optimization;
Maintenance issues

Before you invest tens of millions in new equipment

Let us work with you to improve your operations with your existing equipment by leveraging the data that you already have, and for a fraction of the cost of other methods.

After you invested tens of millions in new equipment

Apply StatSoft's advanced data driven optimization strategies to fine-tune the equipment to optimize its performance for your specific site and/or the type of boiler/process.

Powered by StatSoft's technologies for Data Driven Process Optimization

- Proven data driven solutions
- Multivariate nonlinear optimization from historical data, no computer expertise needed
- Application of the most advanced data mining technologies specifically adapted for power plant optimization
- Advanced multivariate on-site or remote process monitoring

Leverage the information in your existing data (e.g., in the  **OSIsoft** PI data historian) to optimize power plant performance.



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Examples of Typical Applications and Successes

The following case studies describe applications of StatSoft's technologies to coal-fired cyclone and wall-fired furnaces. The data driven (data mining) approach to plant optimization is equally successful with other common types of furnace designs, manufacturing, and different fuels (coal, gas, etc.), and it is applicable to other types of key operational performance indicators (e.g. urea injection/ammonia slip, ultrasonic leak detection, etc.).

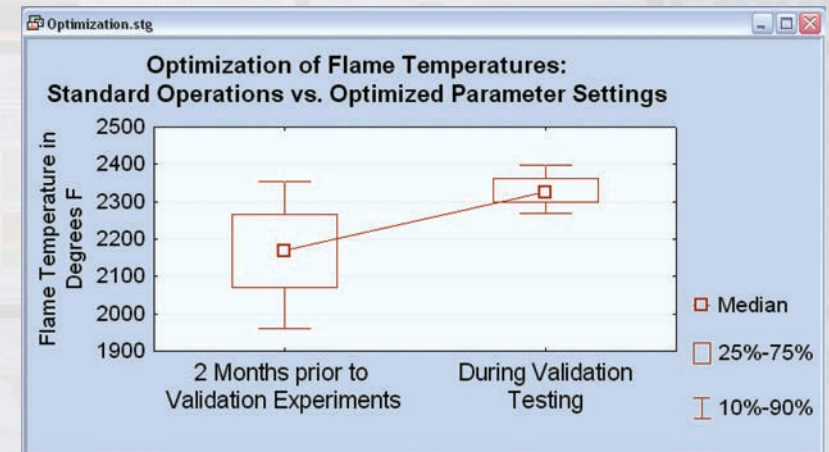
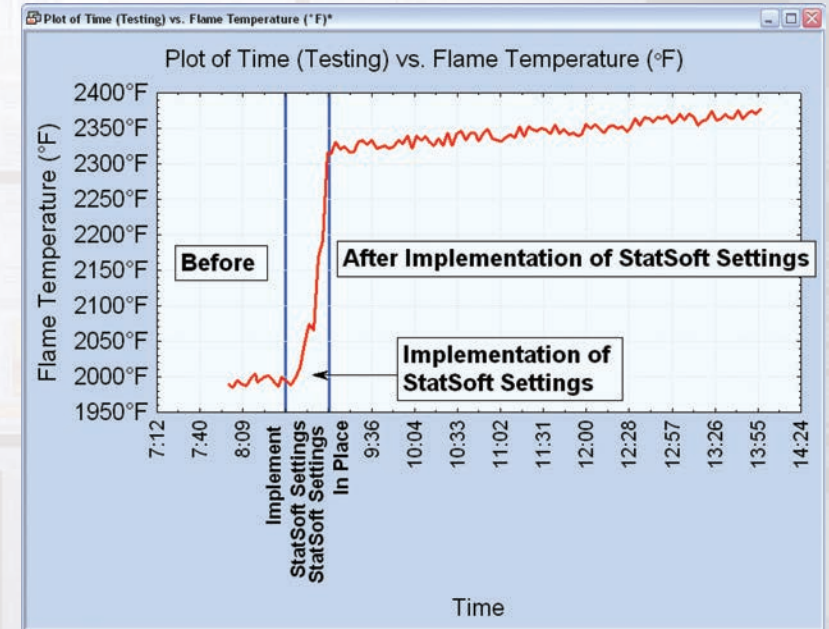
Optimize Operations (Increase Flame Temperatures)

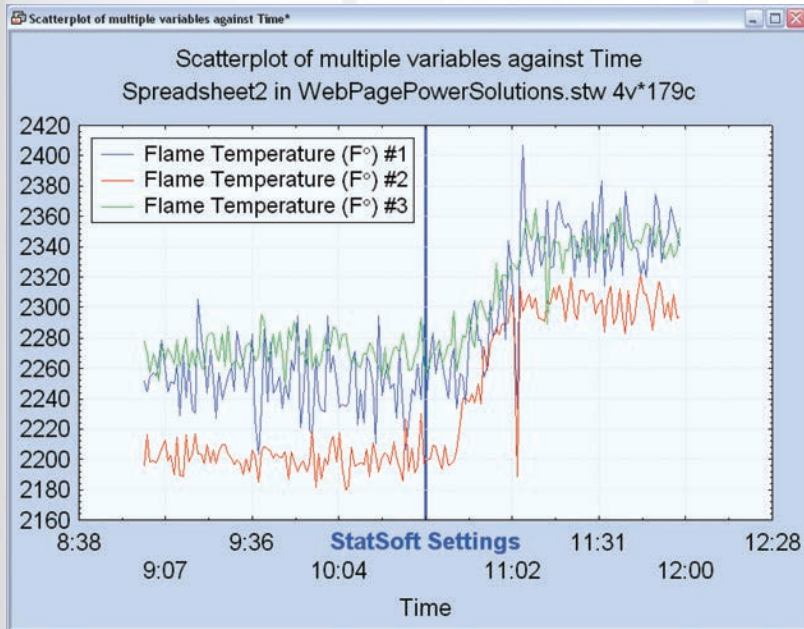
Problem: Optimization of a coal burning 300 MW multi-cyclone unit for consistent high flame temperatures; increase the flame temperatures to avoid forming slag, burning fuel oil, etc.

Solution: Analyze twelve months of three-minute historical data using StatSoft's proprietary data-driven (data mining) methodologies; Identify optimized control parameter settings for Stoichiometric Ratios (S.R.), Coal Flows, Primary Air, Tertiary Air, Split Secondary Air Damper Flows, etc.

Results: After dialing in StatSoft optimized settings, flame temperatures immediately responded (strongly), resulting in more stable and higher flame temperatures (cleaner combustion)

Note: The flame temperature at some of the cyclones had been abnormally and critically low for several days, requiring the burning of fuel oil (at a substantial cost) and intermittent shut-downs; flame temperatures recovered almost immediately after StatSoft's optimized control settings were applied.





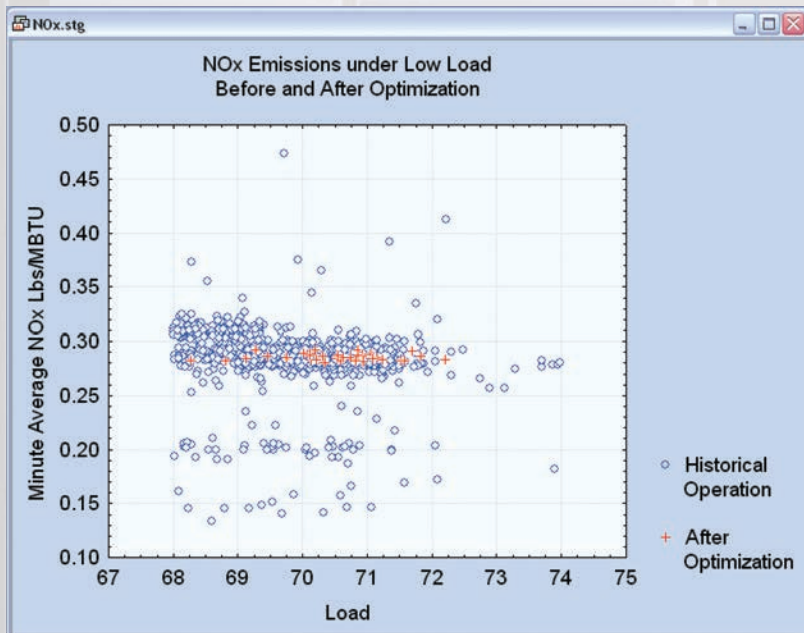
Improve Efficiency and Performance of Your Equipment

Problem: Optimize performance and reliability of ongoing operations; stabilize and improve flame temperatures of an 85 MW coal-burning multi-cyclone unit.

Solutions: Apply StatSoft's proprietary data-driven (data mining) methodologies to consistently increase flame temperatures under a variety of loads.

Results: Flame temperatures increased consistently across all cyclone burners, leading to more reliable operations.

Note: Even though the flame temperatures had been within satisfactory limits, StatSoft's optimized control settings improved temperatures further and beyond historical values



Stabilize Operations

Problem: Optimization of a 400 MW coal-fired DRB-4Z burner for consistent and robust low NOx operations; avoid excursions, expensive downtime

Solution: Apply StatSoft's methodologies to reduce both the average NOx and variability (control variability, then target process for better performance); optimized solution allows burner to operate consistently under normally occurring (external) variability in load, coal quality, etc.

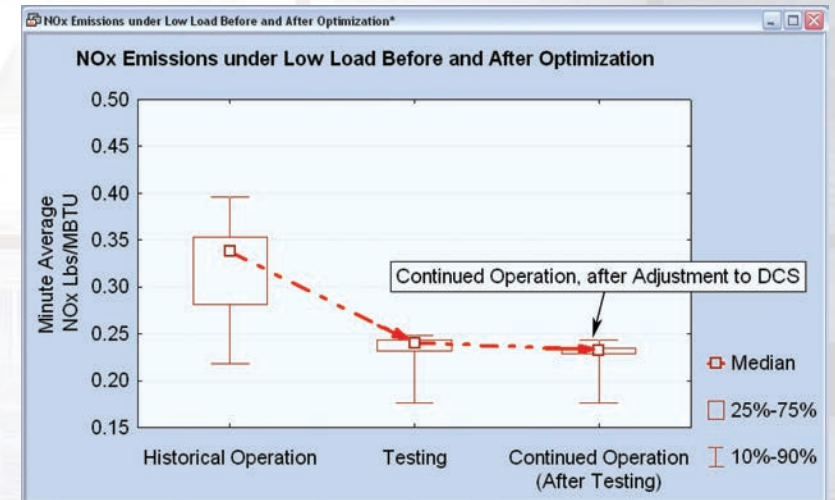
Results: Optimized settings for combinations of control parameters not only resulted in lower NOx, but also greater robustness, i.e. consistently lower NOx emissions with less variability (no excursions) were achieved over continued operations at low load.

Reduce Emissions (NOx, CO)

Problem: Optimization of a 400 MW coal-fired DRB-4Z burner for low-NOx operations under low load (50-175 MW)

Solution: Apply StatSoft proprietary data-driven (data mining) technologies to historical data; identify optimized parameter settings (changes to air flows); results consisted of a set of specific (achievable) input parameter ranges that could be implemented easily into the existing DCS (digital control system).

Results: After optimization, NOx emissions under low-load operations were then comparable to NOx emissions under higher loads.




Predict Problems before They Happen

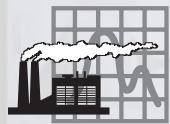
Root Causes: Identify root causes of ammonia slip in a selective non-catalytic reduction process for NOx reduction based on historical data collected at the actual site.

Failures: Predict failures or unexpected maintenance issues.

Call us today to discuss a project to implement the most cost-effective solution for power plant optimization.



The non-profit Electric Power Research Institute (EPRI) recently conducted a study of the StatSoft technology to determine its suitability for optimizing the performance (heat-rate, emissions, LOI) in an older coal-fired power plant. EPRI ordered from StatSoft an optimization project to be conducted under scrutiny of their inspectors. Using nine months worth of detailed 6-minute interval data describing more than 140 parameters of the process, EPRI found that process data analysis using *STATISTICA* is a cost-effective solution for optimizing the use of current process hardware to save cost and reduce emissions.



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