

*A letter from our President & CEO...*

## Feeling the Heat

Earlier this year I asked customers and others in the industry what it would take for electricity demand to start rising again. The answer -- economic recovery and a hot summer.

While economic recovery is tentative in places, the weather is definitely not. NASA called Spring 2010 "easily the hottest Spring on record". In St. Louis and Memphis every day in June was at or above average temperatures, and The Climate Prediction Center's latest forecast for the months of July, August and September indicates that the entire Eastern Seaboard should see hotter-than-average weather.

It is great to contact customers and learn that plants are back on track as they push to meet summer cooling demand -- especially after 2009, the coolest, wettest summer in 40 years. The EIA estimates the total U.S. consumption of electricity across all sectors during the first half of this year increased by 3.8 percent from the first half of 2009. This should have a much-needed positive impact on power producer profits and help our customers as they recover from 2009.

But just as the economic pressures start to ease up, emissions and regulatory pressures are tightening. The EPA recently announced the Transport Rule that is intended to replace CAIR. It proposes to regulate NO<sub>x</sub> in 31 states, not just the 23 under the Clean Air Act Amendment or the 28 under CAIR. The emissions caps are lower than CAAA or CAIR and the proposed compliance deadline is just 16 months away. This puts our customers in a difficult situation, as the duration of capital projects to deal with NO<sub>x</sub> are typically longer than that. Optimizing existing assets with existing infrastructure becomes all the more important.

I have no doubt this will be a hot topic at the Coal-Gen conference, and I look forward to learning how our customers, and the industry as a whole, respond to the opportunity of an improved market for power against a challenging environmental backdrop. ■

*Peter J. Kirk, President & CEO*

*Welcome to*

## COAL-GEN 2010

August 10-12, 2010 | Pittsburgh, PA

**BOOTH  
#820**

This year's Coal-Gen conference marks NeuCo's 9th consecutive year as a conference sponsor. Our continued support underscores our commitment to clean coal technologies that help power generators meet their emissions, efficiency and availability goals.

### Presentation Schedule

*\*All Sessions are in the Asset Optimization Track in Room 303*

#### Tuesday, August 10, 2010

1:30 PM – 3:00 PM	SESSION: Power Plant Availability & Reliability <b>PRESENTATION: Great Catches: How Equipment Health Detection &amp; Diagnostic Systems are Improving Plant Availability</b>
-------------------	---

#### Wednesday, August 11, 2010

9:30 AM – 11:30 AM	SESSION: Pollution Control Equipment Optimization <b>PRESENTATION: CCPI Project Results at NRG Texas Limestone</b>
1:30 PM – 3:00 PM	SESSION: Boiler Optimization Innovations <b>PRESENTATION: Combining Closed-Loop Boiler Optimization with Real-Time Measurement of In-Furnace Combustion Attributes at DTE Belle River</b>

## VISIT US AT BOOTH #820



NeuCo is participating as a Harley Davidson giveaway sponsor. Be sure to stop by our booth to have your passport stamped for your chance to take home the Harley.

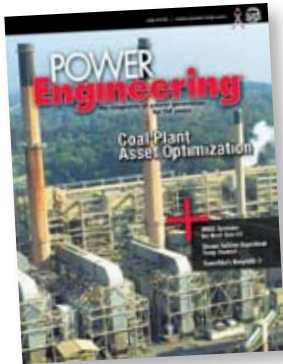


### How Healthy is Your Plant?

Concerned about forced outages or derates due to equipment health issues or sootblowing-related tube ruptures? Come by our booth to find out how we can help.

**Contact us at [info@neuco.net](mailto:info@neuco.net) if you plan to attend the conference and wish to schedule a meeting. Hope to see you there!**

## Power Engineering Magazine Cover Story: AmerenUE & NeuCo



The July 2010 issue of *Power Engineering Magazine* features the cover story: "AmerenUE—Still Pushing the Optimization Envelope." The article, co-authored by Don Clayton, Supervising Engineer, AmerenUE and Rob James, Product Manager, NeuCo, examines AmerenUE's proactive emissions reduction efforts and use of optimization

software across their four coal plants over the past decade. It also details the more recent Boiler Optimization efforts at Meramec Plant. Following are a few of the highlights.

AmerenUE's early commitment to environmental stewardship, innovation and the use of new technology is evidenced by the following:

- It was among the first Midwestern utilities to switch to low-sulfur PRB coal back in the early 1990's.
- It was one of the first utilities to install an over-fire air system on a cyclone unit.
- It began applying a novel combination of combustion optimization, over-fire air, low NO<sub>x</sub> burners and in-house expertise more than 13 years ago at Labadie and extended the success to its other plants.
- For the last decade, Labadie and Rush Island have ranked in the EPA's top 20 coal-fired power plants in the nation in NO<sub>x</sub> performance for units without SCR systems.

In 2007, AmerenUE decided to pursue further emissions reductions and performance improvements at Meramec by installing NeuCo's BoilerOpt package (CombustionOpt® and SootOpt®) on its four units. Units 1, 2 (t-fired boilers) and 4 (front wall-fired boiler) already had Pegasus combustion optimizers so they were converted to CombustionOpt and SootOpt was added; Unit 3 (front wall-fired twin boiler) did not previously have any optimizers.

NO<sub>x</sub> reduction continued to be a top company priority but sootblowing optimization was also important to Meramec because the plant had a lot of erosion-related

tube ruptures, especially on Unit 3. These ruptures caused forced outages. Unit 3 also had significant temperature issues: air pre-heater (APH) gas inlet temperatures were very high at full load and constrained capacity. On Unit 4, carbon monoxide (CO) and a significant imbalance in reheat steam temperatures between the east and west sides were the chief concerns. On Units 1 and 2, reheat and superheat steam temperatures tended to drop too low at low loads.

### Unit 3 Benefits:

- Reduced and more balanced sootblowing activity, especially on the long lances that contributed to erosion issues and associated tube leaks. Sootblowing was cut almost in half.
- Exit gas temperature excursions over the unit's high limit were reduced, which, in turn, helped to increase its maximum output by up to 25 MW.
- Superheat and reheat steam temperature ranges were narrowed, improving temperatures while reducing attemperation sprays.
- Additional NO<sub>x</sub> reduction.
- Operators spend less time managing sootblowing and monitoring exit gas and steam temperatures and more time on other priorities.

### Unit 1, 2 & 4 Benefits:

- NO<sub>x</sub> Reduction: NO<sub>x</sub> was reduced by an across load average of 14 percent on Unit 1, by up to 40 percent at low load on Unit 2.
- Sootblower actuation counts: For Units 1 and 2, long lance and wall blower events were reduced by about 38 percent and 26 percent, respectively. On Unit 4, the sootblower actuation counts for the APH long lances had to be increased to obtain optimal heat absorption in the air heater.
- Temperatures: On Unit 4, the split in reheat steam temperatures between the east and west sides were reduced from 25 degrees to 8 degrees, and air pre-heater gas inlet temperatures were also significantly improved. On Units 1 and 2, steam temperatures were improved on the reheat section at low loads, a key challenge for these units.

[Click here to access the entire article online.](#)

### Ask The Experts:

#### Q. What's the Value of Integrating BoilerOpt and ZoloBOSS?

**A.** Integrating NeuCo's BoilerOpt package (CombustionOpt and SootOpt) with Zolo Technologies' ZoloBOSS system can significantly enhance the value of both systems.

ZoloBOSS provides real-time data indicating key combustion species compositions (CO and O<sub>2</sub>) and temperatures directly within the combustion zone. Real-time signals from the ZoloBOSS system provide data localized to specific regions of the furnace regarding potential slag-forming zones, corrosion-forming zones, fuel-rich zones of incomplete combustion, and zones where high NO<sub>x</sub> is being formed.

Manual boiler tuning and closed loop optimization don't substitute for one another but rather complement each other. For example, both over-fire air and low NO<sub>x</sub> burners have air dampers that can be controlled online through the plant's control system and biased in closed-loop with CombustionOpt to balance combustion and thereby minimize NO<sub>x</sub> and improve heat rate.

To sustain optimal combustion performance, especially over changing operating conditions (fuels, loads, mill combinations, etc.), CombustionOpt uses data regarding internal furnace species and temperatures to adjust the operational settings such as dampers and feeder speeds to moderate or eliminate zones of unsatisfactory combustion (areas of low O<sub>2</sub> and/or high CO). With data directly in the combustion zone, finer CombustionOpt models can be developed between manipulated variables (such as damper settings) and controlled variables (CO or O<sub>2</sub> balance) in order to improve the optimization function (such as NO<sub>x</sub> or heat rate). An optimization strategy based on finer, frequently-retrained neural models can more quickly make adjustments based upon current fuel properties and current

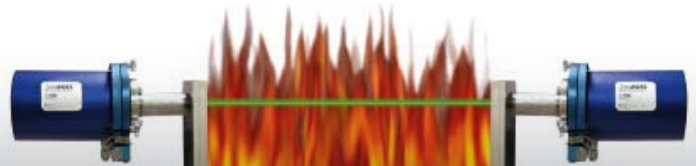
equipment conditions rather than the conditions that prevailed at the most recent boiler tuning.

According to DTE Belle River engineer, Chris Steiger, "control room operators and plant engineers do not have the time to perform manual tuning duties to the extent that would be required to achieve and maintain fully optimized combustion and fully realize the benefits of the Zolo system. NeuCo is a 24/7/365 dedicated combustion engineer and control room operator."

NeuCo can also integrate the ZoloBOSS data into its SootOpt system. SootOpt uses the local, real-time temperature measurements directly in the furnace to create more specific models for cleanliness and rules for cleaning actions. SootOpt can also use real time information on combustion to reduce slagging. The biggest single cause of slagging is temperature exceeding the ash fusion point of the coal being burned. Furthermore, the ash fusion temperatures can be significantly reduced where there are localized areas of low O<sub>2</sub>. The ZoloBOSS provides SootOpt with better data about heat transfer and conditions conducive to slagging such as high temperatures and low O<sub>2</sub> thereby allowing SootOpt to take preemptive action.

BoilerOpt and ZoloBOSS are strongly synergistic technologies that can substantially improve unit operations with respect to efficiency, emissions and availability. Data from ZoloBOSS can be turned into optimal action by adding BoilerOpt, and the benefits of BoilerOpt's actions can be improved through the detailed process information made available through the ZoloBOSS data. ■

*Have a BoilerOpt system and interested in ZoloBOSS? Have ZoloBOSS and interested in BoilerOpt? Contact us at [info@neuco.net](mailto:info@neuco.net) or 617-587-3160 to learn more.*



### Plant Optimization Tour Survey Results

Thanks to everyone who completed NeuCo's recent Plant Optimization Tour Survey. Results have been compiled and due to the strong demand and variety of responses, we have decided to host two Tours this Fall – **one in the Southwest and one in the Midwest.**

Details will be emailed shortly. If you work at a power generation company and want to attend the next tour, [click here](#). If you'd like to contribute ideas to future tours, [click here](#).

**NeuCo On the Move...** We've had a very busy few months relocating all three offices. Please make a note of our new addresses below. Get full contact details at [www.neuco.net](http://www.neuco.net).

**Boston, MA:**  
33 Union Street, 4th Floor, Boston, MA 02108

**Mentor, OH: Customer Support Center**  
7215 Center Street, Mentor, OH 44060

**Austin, TX:**  
815 Brazos Street, Suite 800, Austin, TX 78701

## CASE STUDY: CPS Energy's J.T. Deely Station

### Optimization Doesn't Need Perfection – Achieving Big Benefits In the Face of Known Problems

During the first quarter of 2010, CPS Energy's J.T. Deely Station was operating with the worst coal it had ever burned, with big hard chunks of limestone at the bottom of the coal piles seriously degrading mill fineness. The plant also discovered a subtle but serious logic problem in the DCS affecting mill (primary) air control. While both problems were discovered early in the New Year, it was going to require three months or more to resolve them.

Historically, there has been a predisposition among Control Room Operators to disable combustion optimization systems once problems of this magnitude are discovered, awaiting their resolution to re-engage. At CPS Deely, however, Plant Management and Engineering, in conjunction with NeuCo's Customer Support team, had been working closely with Operators to maximize their understanding and buy-in and enhance benefits. As a result of their comfort level with the system, Deely Control Room Operators left CombustionOpt enabled for approximately two-thirds of the three-month period during which these underlying problems were being experienced.

Because some Operators did disable the system, we had more "OFF" data than usual and so we took the opportunity to conduct an "ON-OFF test." The ON versus OFF data were analyzed and there were no systematic differences

in coal or load or other conditions between the OFF and ON states other than the impact of CombustionOpt on its primary objectives, including NO<sub>x</sub>, efficiency, CO, opacity, and minimizing unnecessary reheat sprays. Because CombustionOpt was not only making its normal adjustments, but also compensating for the underlying unit performance issues to the extent it could within its constraints, Deely observed a significant improvement in heat rate – beyond the more typical 0.5% to 1% – as well as strong but more typical NO<sub>x</sub> reductions.

A detailed examination of the components of heat rate made it clear why efficiency was so greatly improved when the optimizer was ON. Reheat sprays, which have a strongly adverse impact on heat rate, were reduced by 47% relative to the OFF data. CO and opacity were also dramatically lower, and average O<sub>2</sub> was lower by 4.5%.

In essence, while saddled with a crippled unit with two known and serious underlying problems, Deely Operators were able to use CombustionOpt to reduce efficiency losses and use this energy to generate electricity instead. While CombustionOpt can't solve big underlying problems with the boiler, it can compensate for them until the problems can be resolved – potentially saving a lot of money. ■

## How healthy is your plant?

### Are you worried about Forced Outages & Derates?

Have you experienced:

- Sootblowing-related Tube Ruptures?
- Equipment Failure?  Slagging?



If you've answered yes to any of these questions, NeuCo's optimization & predictive analytics software can help. Our prescription for Plant Reliability includes:

**BoilerOpt** - optimizes fuel-air ratios and better manages sootblowing to minimize tube ruptures, slagging and fouling, and improve steam temperature control, opacity and NO<sub>x</sub> emissions.

**MaintenanceOpt**<sup>®</sup> - identifies and provides early warnings of equipment health issues and provides context data and diagnostic support to expedite problem resolution.

Find out how NeuCo can get your plant on a healthier track. Email us at [info@neuco.net](mailto:info@neuco.net).

Comments? Want more info? Visit us at [www.neuco.net](http://www.neuco.net) or email us at [info@neuco.net](mailto:info@neuco.net).