NeuCo
The Optimization Standard™

OPTions

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HAPPY NEW YEAR!

The beginning of a new year is always a good time to pause and take stock of one's accomplishments in the year gone by and goals for the year ahead.

2006 was a milestone year for NeuCo — with the acquisition and integration of Pegasus Technologies, the commercialization of three new products to round out our optimization suite, and the welcoming of many new customers into our Users Group. I would like to sincerely thank you for your support and contribution to this success.

2007 promises to be an even bigger year. It is a year for partnering with our customers more than ever. It is a year for demonstrating the value of our core optimization suite on our customers' bottom lines. It is a year to break down the walls between processes, technologies and solutions to extract the greatest possible value from our customer's assets. As optimization gains "must-have" status in the power generation industry, NeuCo is proud to be leading the way with you.

All the best to you and your families in 2007. I look forward to working more closely with you in the months ahead.

Sincerely,
Curt Lefebvre, *President & CEO*

TREND WATCH: Generation Benchmarking

Increasing demand, fuel costs, environmental pressures and competition provide a difficult set of challenges for electric generators, creating the need to reduce costs, improve performance and increase value. Managers are being driven to ask: How can our generating assets be managed and operated more efficiently? How can we extract as much value from our assets as possible? Which plants should be retained and invested in, and which should be retired or sold? The result is ever-increasing scrutiny on the effectiveness of operations and maintenance (O&M).

This increased scrutiny is behind the increased demand for asset performance metrics, such as reliability, commercial availability, capacity, heat rate, maintenance costs and environmental compliance costs. Superior generation asset performance will be achieved by being better than others at identifying and prioritizing emerging problems, quickly determining root causes, facilitating the flow of information and driving corrective actions. Plant performance and reliability issues tend to be interrelated so operations and maintenance groups need to work together in a proactive environment to best affect improvements in plant and fleet financial metrics.

Technology and innovation are required to make these things possible. A variety of assessment, analysis, optimization and benchmarking approaches are being developed and refined. However, pushing the envelope to exploit these new technologies requires a "culture of innovation," which is not always found in organizations that were developed as regulated utilities without competitive pressures and environmental challenges. Fostering a culture of innovation requires focused leadership, appropriate metrics, an emphasis on new business models and organizational incentives to encourage innovation.

Addressing these complex and interrelated problems requires a concerted effort that starts at the top but permeates all levels of the power generation organization. It involves standardization of performance metrics, accountability, fostering an innovative culture, and adoption of enabling technologies that are consistent with the overall bottom-line objectives of the organization.

For comments or questions contact Peter Spinney at spinney@neuco.net. ■

New Member Spotlight: Alliant Columbia

NeuCo is pleased to introduce Alliant Columbia Energy Center (CEC) Unit 2 as one of our newest Users Group members. CEC 2 has signed a three-product unit optimization contract featuring CombustionOpt®, SootOpt® and MaintenanceOpt™.

The motivation behind this multi-product purchase was the Clean Air Interstate Rule (CAIR) which requires large NO_X reductions starting in January 2009. In addition to taking a proactive approach to CAIR compliance, Alliant will benefit from its near-term NO_X reductions by trading in the Ontario allowance market.

Alliant views this project as the first step towards a more comprehensive integrated optimization solution to address emissions, efficiency and commercial availability goals in a cost-effective manner. ■

Inside

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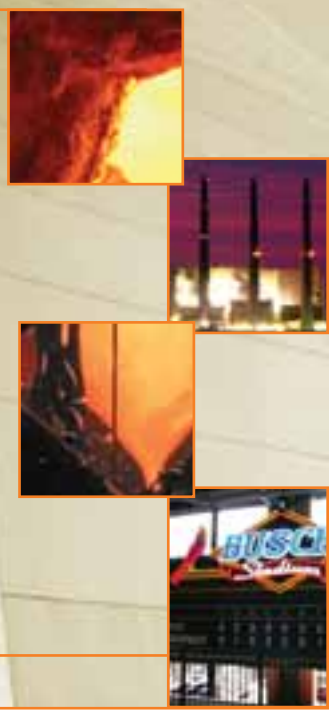
REGISTER TODAY!

ProcessLink® USERs SUMMIT 2007

Meet Me in St. Louis!

ST. LOUIS, MO WESTIN ST. LOUIS MAY 20 – 23, 2007

Ever since St. Louis hosted the 1904 World's Fair, the town has been known as the gateway to innovation... That's why it's an ideal place for NeuCo's 2007 ProcessLink Users Summit – the largest ever gathering of real-time asset optimization users, developers, implementers and visionaries. Together we are reshaping the way today's electric power generators solve their Availability, Emissions & Efficiency challenges.



Why You Should Meet Us There:

- Tour Dynegy's Baldwin Energy Complex to see NeuCo's integrated optimization suite in action
- Hear case studies & learn best practices from NeuCo and Pegasus customers
- See the first ever combined Model Predictive Control and Neural Network combustion optimization solution
- Get hands-on experience with NeuCo's MaintenanceOpt™, SootOpt®, PerformanceOpt® and CombustionOpt® products at the ProcessLink DemoZone
- Help shape tomorrow's optimization applications during customer-led working groups, including input into NeuCo's CCPI Round II Mercury Speciation and Multi-pollutant Control project
- Experience fabulous networking events in the town known for Baseball, Bud & Blues…

Register now at www.neuco.net/userssummit or email us at info@neuco.net.

NeuCo Solutions Profiled at POWER-GEN 2006

At the 2006 Power-Gen Conference, NeuCo showcased its optimization software solutions during the "Changing Conditions? Time to Optimize (Again)!" session. Howard Rosenof, Principal Engineer at NeuCo, delivered a presentation entitled "Strategic Dispatch Management Using Optimization Technology at AMP-Ohio." Co-authored by Scott Barta of AMP-Ohio and Peter Spinney of NeuCo, the session focused on NeuCo's combustion optimization and unit dispatch systems installed at AMP's four-unit R.H. Gorsuch Generating Station.

Joe Naberhaus, Director Operations Performance, Dynegy Midwest Fleet Operations, also delivered a presentation, which profiled the integrated combustion and soot blowing optimization systems installed at Dynegy's Baldwin Energy Complex. The presentation was co-authored by Rob James of NeuCo.

NeuCo also hosted a hospitality event at Orlando's famous Butcher Shop Steak House, which brought together industry enthusiasts for a night of networking. ■

Upcoming Conferences:

EPRI Heat Rate Improvement Conference

January 24 – 26, 2007 | Charlotte, NC

NeuCo Booth #: TBD

Presentation: "A Global Approach to Soot Cleaning Optimization at Dynegy's Baldwin Energy Complex"
Speakers: Randy Short, Dynegy Baldwin and Rob James, NeuCo

Presentation: "Integrating Plant Monitoring and Diagnostics"
Speakers: David Brill, Black & Veatch, Sanjay Patnaik, NeuCo, and Larry Jorgensen, Deseret-Bonanza Station

2007 Reinhold NO_X Roundtable & Expo

February 5 – 6, 2007 | Cincinnati, OH

NeuCo Booth #: 20

Presentation: "An Integrated Approach to Boiler Optimization"
Speakers: Joe Naberhaus, Dynegy Midwest Fleet Operations and Peter Spinney, NeuCo

Please contact us at info@neuco.net if you will be attending!

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Ask NeuCo

Q: Does NeuCo use Model Predictive Control technology?

A: For years NeuCo has been developing hybrid optimization solutions, i.e. those using multiple technologies to best address the optimization challenge at hand. As a result of its acquisition of Pegasus Technologies, NeuCo gained considerable model predictive control (MPC) expertise. One way we have put that expertise to work is through the development of the industry's first combined steam temperature and NO_X control system that uses both MPC and neural network technologies. NeuCo recently commissioned this system for CPS Energy, the nation's largest municipally owned utility that provides electric service to 640,000 customers in and around San Antonio, Texas.

CPS Energy strives to generate a low cost, reliable supply of electricity while minimizing its impact on the environment. The company's JT Deely 2, an Alstom-CE tangentially fired sub-critical, 440 MW unit that burns PRB fuel, recently adopted NeuCo's combined NO_X/steam temperature control solution. The goal of the project was to improve unit efficiency by better controlling steam temperature while minimizing emissions of NO_X.

The project used a combination of neural networks and model predictive control technologies to control the fuel and air staging within the furnace. Neural network technology was used to control stratification within the furnace while model predictive control was used to control gross boiler conditions throughout the furnace by manipulating the separated over-fired air dampers, oxygen bias, and burner tilt positions. An overview of the project will be presented at the 2007 Users Summit in St. Louis.

Please submit "Ask NeuCo" questions to info@neuco.net. ■

Expert Spotlight

Matt Wood is a Senior Performance Engineering Specialist with NeuCo's partner, Black & Veatch (B&V). We asked Matt, who has led B&V's Monitoring & Diagnostics (M&D) Center since its inception in 2001, to talk about the importance of this area of B&V's business.

What does B&V's Monitoring & Diagnostics Center do?

B&V's subscription-based remote monitoring service is designed to help our clients achieve improvement in day-to-day operations and maintenance decisions that positively impact the performance and reliability of their facilities. We rapidly become an integral part of each plant's performance and reliability improvement team by applying our proven M&D process to support the client in identifying, diagnosing, prioritizing, and resolving specific identifiable problems.

Why do you think demand for this type of service has been increasing?

First, market and regulatory dynamics are raising the importance of both performance and reliability. Second, relatively low-cost enabling technologies have emerged that allow a trained data analyst at a centralized and/or remote facility to monitor multiple plants. These technologies include secure high-speed Internet connectivity, corporate wide area networks, standardized protocols for data communication, enterprise historians, and advancements in real-time monitoring, diagnostics and optimization platforms, such as NeuCo's ProcessLink.

What are some of the most common problems you help to identify and resolve?

We help to identify and resolve a broad set of emerging and chronic problems. Examples of emerging problems are leaking cycle isolation valves, sticking or inoperable dampers, failing bearings, dirty motors, failing feedwater heaters, condenser or flue gas duct air in-leakage, combustion imbalance and turbine damage. Examples of chronic problems include condenser or air heater fouling. We often also become engaged in engineering solutions to reduce the chronic nature of the problem.

What value do software tools such as PerformanceOpt® & MaintenanceOpt™ bring to the M&D center?

The M&D Center is all about efficiently extracting actionable information from the massive amount of data available at most plants. Most chronic and emerging plant problems cause changes in plant data that, when correctly evaluated, can identify current and potential future problems. Many software tools address specific pieces of the puzzle (anomaly detection, ad-hoc data trending, first principle modeling, etc.). The NeuCo suite brings all of the necessary M&D Center functionality into a single enterprise solution.

NeuCo's PerformanceOpt and MaintenanceOpt systems constantly seek and alert the user to anomalies that could indicate potential problems. They provide problem-specific context data that allows the M&D Center specialist to rapidly evaluate the validity of potential problems. The systems also provide problem-specific diagnostic advice to enable rapid diagnosis and they use real-time plant data to calculate the real impacts of the problems and to factor in equipment inter-relationships. Ultimately, the combined solution provides an effective workflow for detecting potential problems, ruling out false alarms, diagnosing the cause, prioritizing action, and capturing the specific data and knowledge to aid in diagnosing future problems.

Matt Wood can be reached at woodmm@bv.com. ■

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Product Spotlight

MaintenanceOpt™

What does MaintenanceOpt do?
It detects reliability-, capacity- and efficiency-related anomalies and provides the information necessary to diagnose which anomalies point to real problems, to identify the causes of the problems and to prioritize the urgency of resolving them.

What benefits does it provide?

1. Improves reliability by detecting and helping to diagnose potential equipment failures and prioritizing them on the basis of the monetary impact the failures would have if they were to occur.
2. Improves capacity and efficiency by detecting and diagnosing controllable losses and prioritizing them on the basis of their monetary impact.
3. Streamlines the workflow with which plant anomalies are identified, diagnosed and resolved, saving valuable time and enabling the plant to focus on resolving the most important problems first.

What anomalies does it diagnose?
Those identified through MaintenanceOpt's anomaly detection engine, by other NeuCo Optimizers, by other anomaly-detection tools, or by plant or remote monitoring engineers.

How does it improve workflow?
It helps engineers manage the entire lifecycle of a detected problem more efficiently and effectively. Even after anomalies are detected, it takes time for staff to investigate potential problems to see if they are real and to determine how important they are. MaintenanceOpt saves time by displaying all in one place the information required to determine whether the detected anomaly points to a real process/equipment health problem. If the user decides the problem is real, he escalates the problem for diagnosis. The diagnostics clearinghouse identifies possible causes for the problem and draws attention to the data that indicates which cause is most likely. Based on the impacts MaintenanceOpt projects and on other available information, plant engineers assign a priority to the problem and put it on the action list. Additionally, MaintenanceOpt can be customized to integrate with a CMMS and existing maintenance processes.

What is the advantage of using MaintenanceOpt and PerformanceOpt together?
PerformanceOpt combines a first-principles model of the entire steam cycle with the ability to run online simulations to provide a much more fine-grained impact analysis of efficiency and capacity problems. Thus there are fewer false positives to waste time finding and there is more accuracy about the problem's actual impact on profitability. In addition, the detailed thermal understanding of the process provided by PerformanceOpt supports the identification of additional anomalies, and it enables MaintenanceOpt to better diagnose detected problems. ■

Employee Spotlight

Name: Steve Piché

Title: Director of Research & Development

Explain your role at NeuCo.
I work with the Product Management team to develop new products using advanced control and optimization techniques.

Briefly describe your background in the power industry?
I've worked generally in the process industries for the past 15 years and specifically in the power industry for the past five years. I have worked for Pavilion Technologies, Pegasus Technologies and now NeuCo.

How has your view of the industry changed?
Since I first started working in the process industries, I have seen a lot of changes. From my perspective, the largest change has been the wide acceptance of neural network optimization technology. I am proud to have been a contributor to this shift through my work at Pavilion, Pegasus and NeuCo.

What do you foresee happening with optimization technology in the power industry over the next several years?
Quite simply, I expect more optimization systems to be installed not only for combustion optimization but also for back-end systems such as the SCR, ESP and FGDs.

What are some of the major problems looming over the power industry?
The biggest challenge facing the industry is air emissions including NO_x, SO_2, mercury and, perhaps most significantly, CO_2. I expect to see more pressure to control emissions and NeuCo needs to continue to be part of the solution.

What excites you about your work?
In '92, I received my doctorate in electrical engineering from Stanford in the obscure field of neural networks. At that time, I was not sure what the future was for neural networks. There were few "real-world" applications and I was wondering if I had spent 5 years specializing in a soon-to-be irrelevant technology. Nearly 15 years later, I am excited to see that this obscure field has led to real companies that contribute significant benefits for the power industry. I wake up excited to continue to expand this technology! ■

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