# REINHOLD ENVIRONMENTAL Ltd.


# 2011 NOx-Combustion Round Table & Expo Presentation

February 7-8, 2011, in Birmingham, AL / Hosted by Southern Company

# Unit-Wide Optimization Systems: A CCPI Case Study

***Ray Johnson, NeuCo, Inc.***

***Reinhold NOx Roundtable 2011***

NeuCo
The Optimization Standard™

ProcessLink®

# DOE Clean Coal Power Initiative (CCPI)

- Department of Energy CCPI Overview:
  - 10-year, $2 billion program
  - Demonstrate promising technologies - proven through R&D to have commercial potential
  - Government provides up to 50% of the cost
  - Demonstrations at a commercial scale in operating environments
- NeuCo and NRG Limestone Project Goal:
  - To demonstrate the ability to **affect** and **optimize mercury speciation** and **multi-pollutant control** using non-intrusive advanced sensor and optimization technologies, with no impact to saleable products and an improvement in heat rate

NeuCo
The Optimization Standard™

# Project Objectives

- Optimization of plant's overall performance through an optimization system that will arbitrate among the point solutions of individual pieces of equipment
- NOx – Target of 10% reduction in emissions
- Heat Rate – Target improvement of 0.5-2.0% as shown using Heat Loss Index and/or ASME part 4 calculations
- Hg (Mercury) – Target of 40% post combustion mercury capture though optimized mercury speciation
- Increased Operating Controllability and Flexibility
- Reduced Fuel Consumption 0.5-2.0% normalized to fuel type and kWh generation
- Reduced Capital Investment Compared to Alternative Emissions Reduction Systems

# NRG's Limestone Electric Generating Station Unit 2

## Unit Overview:

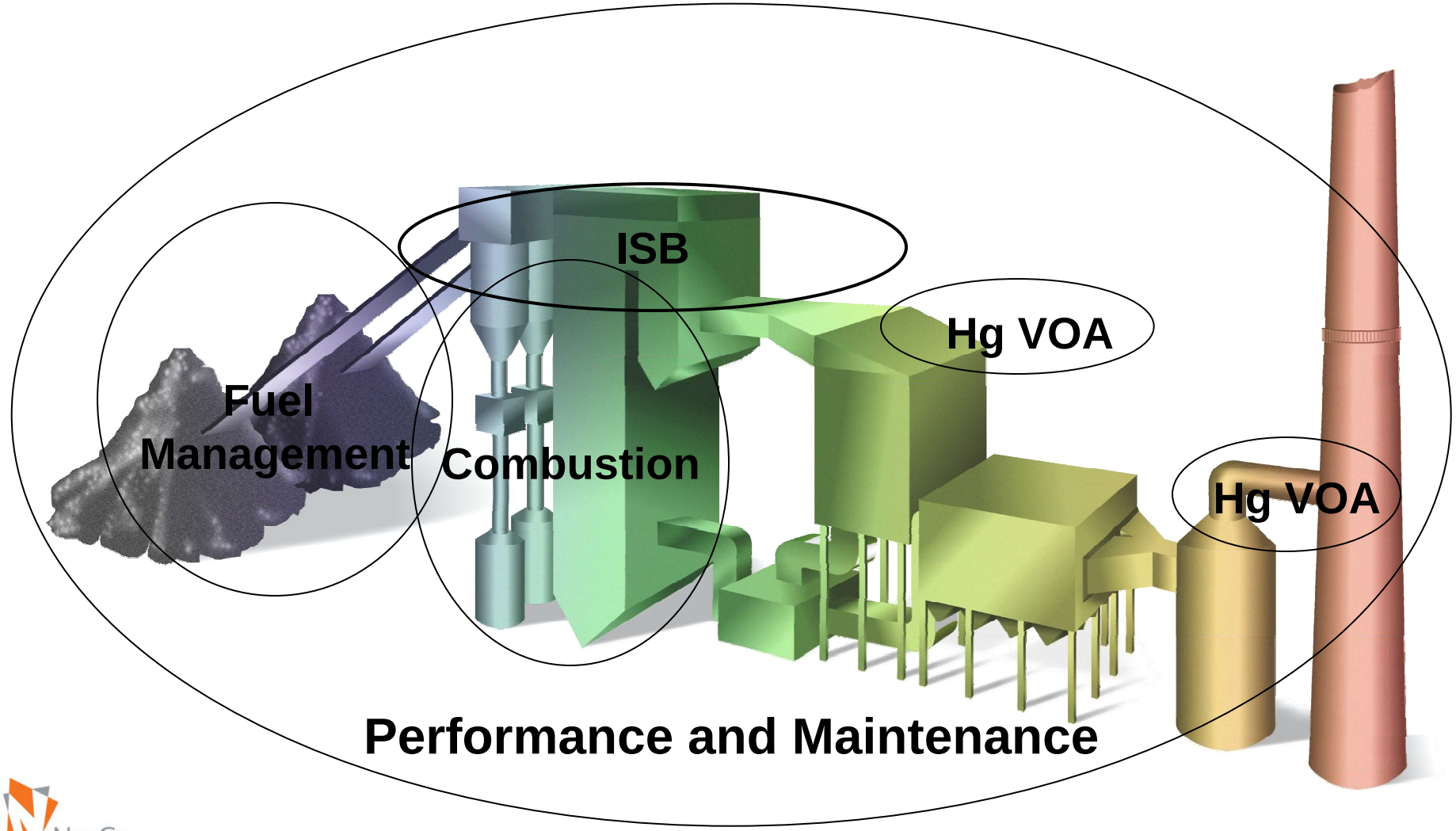
- T-fired boiler 913 MW fueled with Lignite and PRB
- Ten fuel elevations equipped with a low-NOx burner/overfire air system
- Cold side ESP and wet FGD
- DCS control system is a Bailey Infi-90

## Optimization Goals:

- Reduce emissions (NOx, Hg, $SO_2$)
- Improve unit heat rate
- Increase operating control & flexibility
- Manage tradeoffs between unit performance goals

NeuCo
The Optimization Standard™

# Optimization Focal Points




NeuCo
The Optimization Standard™