

Emerson's SmartProcess® Combustion Optimizer Produces Average 9.2% NOx Reductions

RESULTS

- 9.2% average NOx reduction across six units
- 25% average CO reductions
- Improved steam temperature stability
- Three-month project cycle for each unit
- No outages required

APPLICATION

Six 181 MW Powder River Basin coal-fired units, each with a CE tangential boiler and GE steam turbine generator.

CUSTOMER

Electric Energy, Inc., a subsidiary of Ameren, Joppa Station, located in Joppa, Illinois.

CHALLENGE

In the 1990s, Electric Energy, Inc. (EEI) converted the Joppa Station to burning low-sulfur Powder River Basin (PRB) coal as a means to lower sulfur dioxide emissions, comply with the clean air act, and reduce operating costs. In conjunction with switching to PRB coal, EEI also installed new low NOx burners and level I close-coupled overfire air, which helped to decrease their baseline NOx emissions.

The success of this conversion led the staff at EEI to pursue additional NOx reductions through optimization technology. The ultimate goal was to achieve average stack NOx emissions at the Joppa Station below 0.13 lbs/MMBtu.



“The Joppa station runs year round with the Smartprocess® Combustion Optimizer and realizes an average 9% NOx reduction, improved CO control, and more stable steam temperature.”

Larry Lepovitz
Systems Engineer
Electric Energy, Inc.
Joppa Station



For more information:
www.EmersonProcess-PowerWater.com



SOLUTION

Emerson’s SmartProcess® Combustion Optimizer provided EEI with the solution. The Combustion Optimizer reduced the stack emissions of each Joppa boiler by properly distributing the combustion air for control of both NOx and CO. The initial project was implemented on one unit, and then was extended to all six units after the operational improvements and emissions reductions were proven.

The SmartProcess Combustion Optimizer was commissioned on the six Joppa units between October 2001 and April 2003. Each project consisted of a three-month project cycle and included other advanced control techniques which improved the overall combustion process.

The Joppa station now runs year round with the SmartProcess Combustion Optimizer and realizes an average of 9% NOx reduction, improved CO control, and more stable steam temperatures.

Average NOx Reductions Joppa Station

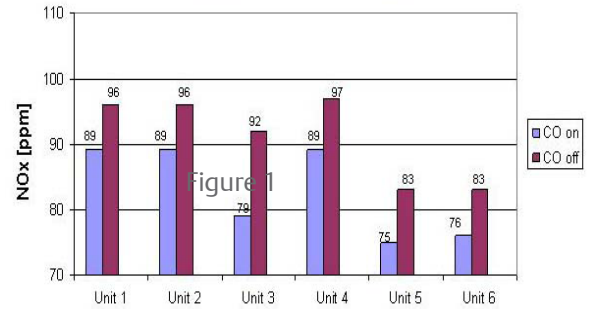


Figure 1. This shows average NOx readings for each unit with and without the SmartProcess Combustion Optimizer.

% NOx Change With Combustion Optimizer

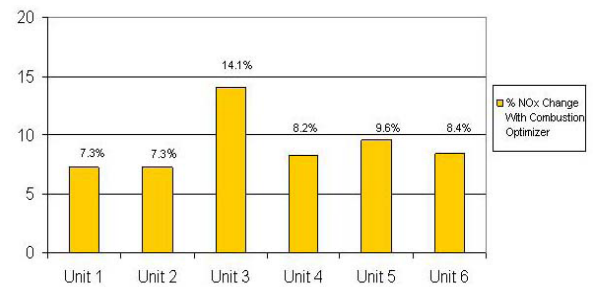


Figure 2. This shows the average percentage of NOx improvement from each Joppa unit.

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