

CASE STUDY

Reduced Cleaning Operations and Plant Heat Rate Jeffrey Energy Center Unit 3

The Challenge

Jeffrey Energy Center Unit 3 is a sub-critical, 780 MW Powder River Basin (PRB) coal fired boiler. The unit was placed in service in 1983 and is one of the first units in the country designed to burn PRB coal. Originally, the unit was rated for 680 MW gross, and could rarely maintain more than several consecutive days without derates. The Furnace Exit Gas Temperature (FEGT) was in excess of the ash fusion temperatures for the PRB coal which caused deposit accumulation on the convection tube assemblies. History of fouling at the plant included frequent tube leaks, plugged pendants, and molten ash carryover in the Economizer.

Prior to the installation of the SMART Clean™, Jeffrey Energy Center implemented additional sootblowing retracts in the backpass, additional tubing surface area, and changed some of the pendants from carbon steel to stainless steel. These implementations proved insufficient and the plant began to monitor differential pressure (dP) readings throughout the boiler which helped determine normal fouling rates for the unit and when cleaning outages needed to be scheduled.

Company with quality system certified by DNV GL ISO 9001:2015

Clyde Industries Delivers

What Jeffrey Energy Center was lacking was a tool to provide a general overview of the unit health and the capability to be more proactive against slagging. To reduce the number of forced outages Clyde Industries proposed SMART Clean™ backed with Clyde Industries's remote performance monitoring & optimization program. A Superheater Fouling Monitor (SHFM), a Thermodynamic Model (TDM), and SMART RS-H Sootblowers were installed on Unit 3.

Unlike conventional systems, SMART Clean™ optimizes the plant heat rate, prevents heavy fouling by localizing the location and tenacity of the fouling in real-time, and uses the information to dynamically manage the sootblower operations.

CASE STUDY SMART CLEAN™

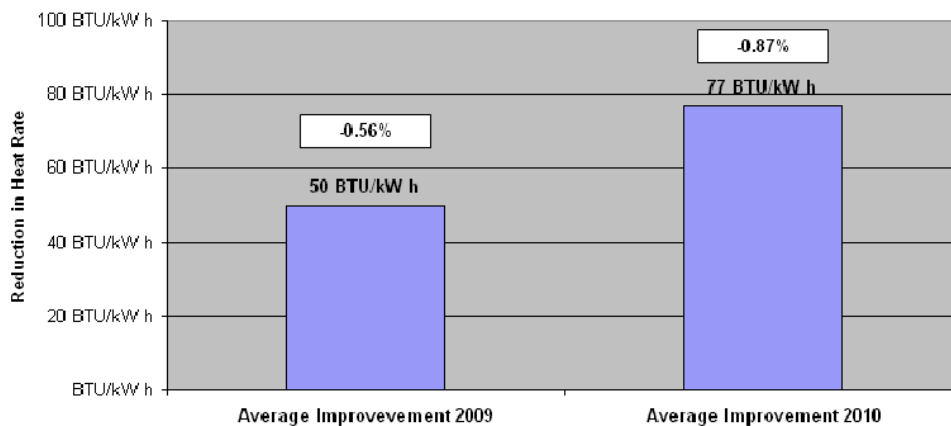
Results that Matter

Since the upgrade to SMART Clean™ there have been no forced outages or fallen clinkers at Jeffrey Energy Center Unit 3. SMART Clean™ logic including Priority Queueing and Exclusion has helped improve the plant efficiency and at the same time reduced the number of sootblowing operations needed to maintain the boiler overall cleanliness.

Project Highlights

- Fouling levels successfully controlled
- Zero forced outages or fallen clinkers since SMART Clean™ installation
- Plant heat rate reduction improvement of 77 BTU/kWh
- Cost reduction in operations by \$1.1 million/year

Plant Heat Rate reduction at J.E.C. Unit #3



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COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =