



CASE STUDY

SMART Clean™ System San Miguel Electric Cooperative Unit 1

The Challenge

San Miguel Electric Cooperative Unit 1 includes a 440 MW lignite coal fired boiler which had a history of unscheduled shutdowns due to clinker formation. The clinkers would accumulate in the secondary super heater section and fall in the boiler damaging tubes. Prior to the installation of the SMART Clean™ system, all cleaning events were conducted manually according to the boiler operator's discretion and the plant's standard practices.

Historically, the control room operators ran a sectional sootblower sequence two times per 12 hr shift or 4 times per day. Without the knowledge of where the fouling and slagging were located, the operators risked cleaning areas that were not covered by deposits (over-cleaning) or, failed to initiate cleaning activities in the areas that experience heavy accumulation of deposits (under-cleaning).

Clyde Industries Delivers

Clyde Industries provided a solution that enables the plant to fight heavy fouling proactively while improving the cleaning effectiveness in the boiler. The SMART Clean™ solution was supplied to eliminate the costly forced outages caused by clinker fall.

The system installed at the plant consists of 76 conventional retract sootblowers, four variable-speed cleaning sootblowers, four SuperHeater Fouling Monitor (SHFM)-designated zones, and nine ThermoDynamic Modeling (TDM) cleaning zones in the convection sections. Data from the system is also integrated with the plant's distributed control system.

In the year since commissioning, the plant did not experience a single forced outage due to clinkers in the secondary super heater section. Fouling levels were also successfully controlled throughout the convection pass of the boiler. Prior to commissioning the SMART Clean™ system the plant typically saw two outages per year, each equating to 36 hours of downtime and costs of \$700,000 of lost generation.

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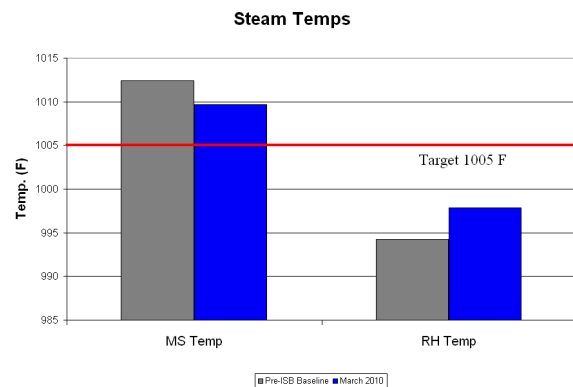
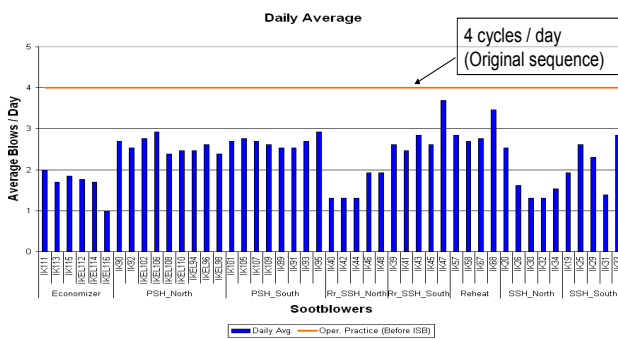
SMART CLEAN™

The plant stressed the following objectives: keep steam temperatures under control and at the same time, minimize sootblower usage to preserve the life of tubes. Under SMART Clean™ San Miguel has been able to reduce steam consumption by reducing sootblower operations from 4 to an average of 2–3 times daily.

Utilizing SMART Clean™ intelligent sootblowing adjusted the cleaning operations and moved the steam temperatures towards the target 1,005°F thereby preserving tube and turbine life. The hot reheat temperature has risen from 994°F to 997°F, helping the plant realize a higher power output. The TDM, SMART Gauge System and variable speed/variable intensity SMART RS sootblowers have helped the plant realize its goal of minimizing clinkers in the super heater section and avoiding costly outages.

Project Highlights

- Eliminated forced outages due to clinkers
- Fouling levels successfully controlled throughout convection pass in boiler
- Reduced steam consumption by reduced sootblower operations
- Sootblower operations decreased from 4 to 2-3 daily cleanings
- Steam temperature drop from 1,012°F to 1,009°F preserving tube and turbine life
- Hot reheat temperature rise from 994°F to 997°F, helping the plant realize a higher power output



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