

Industrial Boiler Fingerprint

Identify opportunities for boiler performance improvement

Boiler benchmarking establishes current performance level and a basis for evaluating and identifying improvement opportunities, recommendations for improvement, and associated estimated ROI.

Typical savings potential: \$50,000 – \$250,000

Benefits

- Executive report facilitates management decision process by focusing on high impact opportunities for improvement
- Improvement plan provides clear path to quickly close performance gaps
- Provides a solid foundation for continuous improvement based on data analysis methodology

Features

- Access to ABB optimization experts
- Boiler Performance Benchmarking
- Detailed ROI-based improvement plan

The ABB Industrial Boiler Fingerprint diagnostic service compares existing controls to industry standards, as well as actual operating data to expected capability. It generates both a performance benchmark and an actionable improvement plan.

The fingerprint includes the collection of data to identify efficiency improvement opportunities, including steps to reduce unplanned outages (trips), and to improve availability.

Boiler Performance Indicators

The Industrial Boiler Fingerprint includes comprehensive testing, measurement and analysis of four key performance indicators. The indicators are used to assess performance and improvement potential:

- Instrumentation
- Control System Performance
- Capacity
- Combustion Control and Efficiency



Boiler Audit and Testing

The Fingerprint uses a bottom-up approach to performance improvement. Data collected verifies that basic instrumentation is working as needed, for good operation and control. Configured signal conditioning options are also examined and verified.

Closed loop control of fuel and air flow, draft, steam temperature, and drum level are examined under steady load conditions, and during load ramps. Disturbance rejection, setpoint tracking, actuator mechanical issues and loop interaction are evaluated.

Where maximizing steam generation capability is desirable, the constraining condition is identified. Examination of process control system logic ensures that the improvement capacity is not artificially constrained by the process control system.

Combustion control logic is evaluated and existing process control system controls are compared to ABB standards, Figure 1.

Cross limiting is examined for effect on load rate of change. Proper use of scaling in the cross limits is verified. The integration of O₂ trim with cross limiting system is checked. Efficiency is accurately evaluated using the losses method.

Reporting

At the end of the evaluation period, findings are presented to select members or groups of the site. An Executive Report and Technical Report are provided to disclose the findings and recommendations of the boiler diagnosis.

- **Technical Report** provides supporting data collected during the boiler diagnosis, trends and calculations.
- **Executive Report** provides benchmark results, summary of findings, financial impact of recommendations and an actionable improvement plan, based on the boiler diagnostic steps.

Improvement Plan

The improvement plan provides recommendations for resolving performance issues, and how to move towards optimal performance.

Recommendations may include actuator maintenance, repair/replace/purchase instrumentation, process control system configuration or tuning changes, physical and capital improvements or changes in standard operating procedures.

The ABB Industrial Boiler Fingerprint is the first step in achieving and sustaining higher boiler performance.

Delivery Schedule

Day 1

- Project kick off meeting
- Setup data collection software
- Begin collecting standard operating data to analyze instrumentation and control loop performance
- Collect historical data

Day 2

- Instrumentation survey
- Process inspection and documentation
- Data collection under forced steady operation

Day 3

- Data collection during load step changes
- Examination of combustion controls

Day 4

- Maximum load test
- Efficiency calculation
- Exit meeting, initial findings

Day 5-7

- Data Analysis
- Write executive and technical reports

Communication with the plant precedes scheduled activities to ensure coordination with ongoing plant activities. Daily activities list is provided, which includes items completed during the day, a summary of findings, and a plan for the following the day.

The Boiler Fingerprint is the first step in achieving and sustaining higher performance levels. Annual Fingerprint, Implementation, and Sustaining services are recommended as part of your service contract agreement to achieve and continue the improvement process. These can be schedules within a single- or multi-year service contract agreement.

Boiler Instrumentation Survey

- Fuel flow
- Burner Pressure
- Feed water flow
- Drum pressure
- Steam Temperature
- Draft
- O₂, CO/Combustibles
- SO₂, NO_x, Opacity
- Air flow
- Windbox ΔP
- Drum Level
- Steam flow
- Attemperator flow
- Fan amps
- Exhaust gas temperature

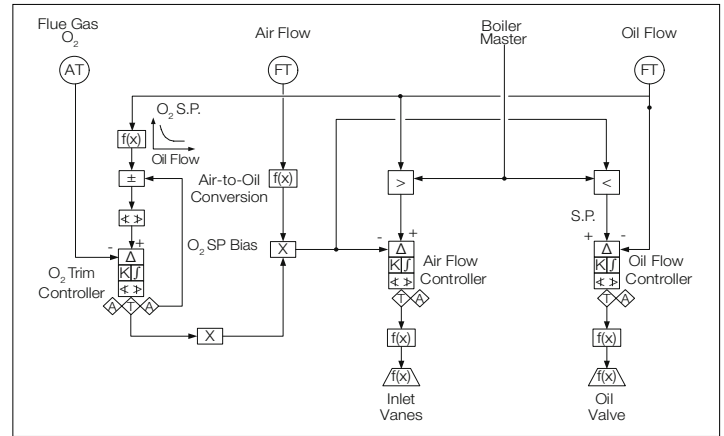


Figure 1 | Standard fuel air cross limiting

Additional Options

- Multiple fuels
- Pulverizers
- Scrubbers
- Sootblowing
- Fuel/Air calibration curves
- Include Plant Master

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