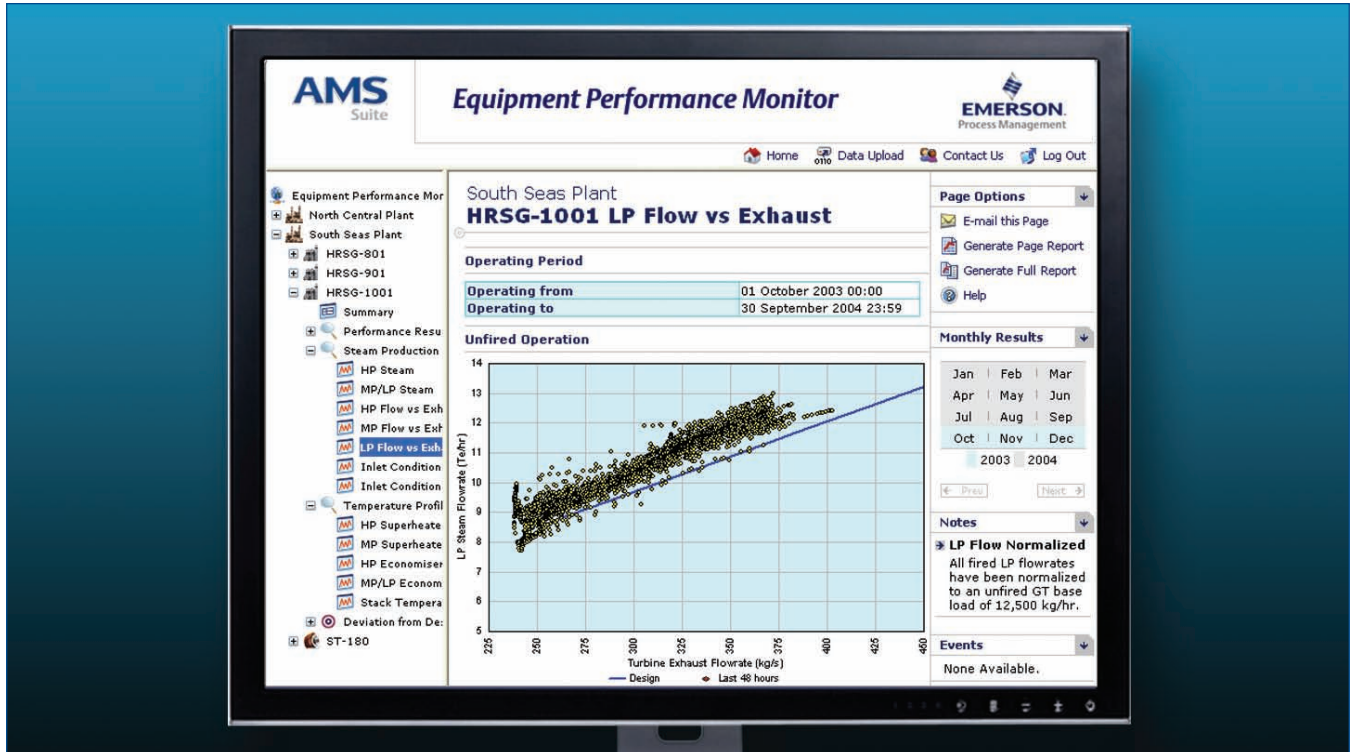


Performance Monitoring - HRSG



Scatter chart displays unfired operation against turbine exhaust and comparison with manufacturing design levels.

- Increase equipment lifespan
- Reduce fuel costs
- Maximize steam production
- Reduce stack gas temperatures
- Identify the rate of steam production degradation
- Monitor fouling on individual exchanger banks
- Evaluate the effect of drum pressure control upon efficiency and steam production
- Continually assess the total heat loss from turbine exhaust to stack

Enable Predictive Maintenance

AMS Performance Monitor helps to achieve peak performance of Heat Recovery Steam Generation (HRSG) units. It facilitates the move to predictive and proactive maintenance programs, maximizing equipment performance.

Equipment Categories

- Fired HRSGs
- Unfired HRSGs
- Single Pressure steam boilers
- Multiple Pressure steam boilers

Success Stories

- Reduced overall fuel costs by identifying the optimum HRSG firing rates at current gas turbine load.
- Evaluated the optimum loading across a net work of HRSGs for a given total steam production requirement.
- Identified poor HRSG performance and reacted to economizer exit temperatures approaching boiling point, avoiding catastrophic failure.

Capabilities

- Analyze performance according to manufacturer specifications.
- Conduct detailed thermodynamic analysis of HRSG operation.
- Analyze temperature profile, using pinch approach.
- Detect heat transfer performance degradation.
- Select optimum duct firing rates.
- Target maintenance to specific boiler components.

Key Performance Indicators (KPIs)

The following indicators are typically presented, based on ASME PTC 4.4 thermodynamic custom-built models:

- **HRSG Efficiency** - The overall ratio of heat input to steam energy output.
- **Heat Loss** - Energy loss from heat source to stack gas, also presented as a percentage of total energy transferred.
- **Steam Production** - The various (HP/MP/LP) steam production rates and corresponding design rates.
- **Superheater Temperature** - Illustrates the superheater outlet steam temperatures achieved per exchanger.
- **Superheater Performance** - Heat transfer loading of each superheater within the HRSG (per exchanger).
- **Inlet Conditions (waste heat/BFW/fuel)** - Together with performance KPIs, view the effect of input conditions on HRSG operation.
- **Economizer Exit Temperature** - Monitor exit water temperatures from (each) economizing section of the HRSG.
- **Economizer Performance** - Heat transfer characteristics of (each) economizer within the HRSG.
- **Operating Envelope (Unfired)** - The unfired steam production level(s) are presented against waste heat load and compared with design levels.
- **Operating Envelope (Fired)** - Fired operation steam production level(s) against firing rates and compared with design levels.
- **Stack Temperatures** - Flue gas temperature profile throughout the HRSG pathway and resultant stack gas temperatures.
- **Evaporator Performance** - Heat transfer properties of (each) evaporating section of the HRSG.
- **Steam Rate Deviation** - Comparison of the process steam production rate(s) with expectation for lost production opportunity.
- **Pressure Deviation** - For multiple pressure level steam production, drum pressure is monitored in conjunction with the steam rate deviations from design.
- **Deviation Cost** - Track cost of performance degradation (based on design/reference).

HRSG Demonstration available at www.AMSPerformanceMonitor.com

Emerson Process Management

Asset Optimization Division

835 Innovation Drive
Knoxville, TN 37932 USA
T 1(865)675-2400
F 1(865)218-1401

©2011, Emerson Process Management.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

All rights reserved. AMS and PlantWeb are marks of one of the Emerson Process Management group of companies. The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their respective owners.