Boiler Control Solutions with Ovation™

Features

- Unit coordinated control of boiler and turbine
- Operator adjustable minimum and maximum unit load (MW) setpoint
- Full range of operating modes to control megawatt and throttle pressure
- Air/fuel cross limiting ensures that boiler combustion is at optimal conditions
- Furnace pressure control circuit maintains a constant pressure through modulation of the induced draft fans
- Feedwater control maintains proper drum level during start-up and low-load operation, and through the normal load changes
- Software "hooks" for SmartProcess implementation

Ovation™ Improves Boiler Strategy

Steam availability is critical to the operation of power plants. Ensuring an adequate supply of steam requires a reliable, powerful boiler control system.

Emerson's Ovation™ control system offers the most advanced system for boiler management and control. With Ovation, sophisticated control schemes integrate boiler and turbine controls and allow efficient management of load, furnace pressure, drum level, and the combustion process. The fully automated boiler control process enables access to more data, lowers costs and enhances the safety of the plant.

Improving Profits, Lowering Costs

Efficiency is not just "built in" to the plant boilers. It's not necessary to accept a less-than-optimal level of efficiency. There are many ways to increase the performance of boiler operations.

Improving boiler efficiency is one of the best ways to increase profits in the power generation industry. Keeping boiler efficiency high can keep operating costs low. Ovation offers powerful, intelligent technology to do just that. Designed to handle complex processes like boiler combustion, Ovation will increase efficiency by:

- Assuring steam availability
- Adjusting to load swings and other variations
- Providing tight integration with turbine controls and burner management systems
- Reducing excess air

EMERSON.

Through these improvements, as well as several more, Ovation offers short-run operational savings that will lead to long-run profits.

Improving Measurement Accuracy

Simply measuring fuel flow or the fuel/air mixture doesn't provide an accurate indication of boiler performance. By incorporating pressure and temperature transmitters right into flow loops, Ovation allows accurate pressure and temperature compensation measurements, so plant personnel are always aware of the operating efficiency. Ovation also has a built-in compensation capability to automatically adjust to changing parameters.

Maintaining Optimum Oxygen Levels

Monitoring and controlling oxygen can dramatically influence profits and costs of boiler operations. Excess oxygen does nothing to improve combustion. Instead, it actually serves to reduce boiler efficiency by absorbing heat that could be used in steam production. Ovation helps to modulate the amount of air in the system to provide the exact amount of air that the system needs, ensuring complete combustion. By regulating fuel-to-air ratios, Ovation automatically maintains oxygen levels without adversely impacting CO and NOx emissions.

Excess air flows increase flue gas heat losses, resulting in lower boiler efficiency. Minimizing these losses requires monitoring of both the percentage of oxygen or carbon dioxide and the stack temperature, both of which are primary indicators of combustion efficiency.

Providing Key Device Information

Not having accurate information about key components such as valves and dampers can become a safety concern. Without the knowledge of device performance, operators will be unaware of situations like dangerous mixing of fuel and air. Ovation provides access to essential information like plant data and diagnostics directly to LAN-connected PCs. This assures that operators always have access to the latest operational data.

Increasing Safety

Aging boilers often vibrate, and most operators are accustomed to making minor changes to compensate for the rumbling. However, these noises could mean that the air/fuel mixture is not optimized, and might be an indication of loss of flame, or a precursor to an explosion. The Ovation system offers accurate flow monitoring to ensure that any reported variations, or lack of variations, are correct, and that the safety of your operators is assured.

Tightening Control

Boilers are affected by changes in fuel, pressure, and temperature, as well as many other anomalies. Changes in fuel or furnace operation, fuel quality, and boiler operation can cause fluctuations to occur in a matter of minutes, and conventional technology can no longer be trusted to handle crucial boiler controls. Ovation provides accurate, intelligent, on-target information and control. Its boiler control strategies offer tight, reliable automation to ensure that the plant is as safe as possible.

Features of Boiler Control

Emerson's boiler control strategy improves safety through tight integration with the burner management system. By improving accessibility to essential information, such as alarms and diagnostics, plant operators work in a safer, easily operable environment. This results in greater availability in the long term. Boiler control features include:

- Unit coordinated control
- Air/fuel cross limiting
- Air flow control stations
- Furnace pressure control
- Feedwater control

Unit Coordinated Control

The Ovation system links the boiler and turbine controls through a coordinated front-end control strategy. This strategy can be implemented on either drum or supercritical boiler. Operators can use the coordinated control to generate and regulate the setpoint for unit load (MW) through local operator entry, remote increase/decrease contact inputs or

internally generated contingencies such as runbacks and rundowns.

Unit coordinated control aligns unit load and throttle pressure by sending out parallel demand signals to the boiler and turbine control loops through the Boiler Master and Turbine Master M/A stations. The Boiler Master demand is used as a feed-forward signal to the loops controlling feedwater, fuel and air flow to improve unit response to load changes. The Turbine Master demand controls the turbine control valves by sending an analog output signal to the turbine controls. Unit coordinated control graphics offer a full range of operating modes to control megawatts and throttle pressure.

EMERSON