Boiler Feedwater Pump Controls

Reduce Energy and Maintenance Costs While Increasing Reliability for Overall Plant Performance

Benefits:
- Reduce energy costs
- Improve plant reliability and uptime
- Reduce maintenance costs
- Improve operational efficiency

Rockwell Automation Industry Solutions

Reduce your energy consumption and improve operational performance with plant-wide solutions from Rockwell Automation. When you choose Rockwell Automation, you are assured innovative products and services that conform to stringent industry requirements.

Our industry experience means that you receive products and services that are field proven to help you minimize downtime, maximize the efficiency of your plant assets and reduce your energy costs.

The Challenges

Boiler feedwater systems are critical to overall power plant performance, but can be one of the single largest energy consumers in the plant. As electrical demand fluctuates, the required boiler feedwater flow rate changes to match make-up water demand. Feedwater flow is created by a large pump that operates at full speed and a modulating valve opens and closes to vary the flow rate supplied to the boiler. This boiler feedwater system consisting of a modulating throttle valve to control flow rate is effective but requires frequent valve maintenance and wastes energy.

Flow Control with Valve

Energy Costs are Constant (100%) with Valve Control

Process Control System

Electrical System
- 100% Energy Costs
- Flow Rate
- Operating Time
- Boiler Feedwater Pump
- Recirc Valve
- From Feedwater Source
- Valve Modulates to Meet Required Flow Rate
- Feedwater to Boiler or HRSG
- Typical (500 to 4,000 Hp)
A Better Way

Reduce energy consumption and lower maintenance cost by controlling boiler feedwater flow with a variable speed drive rather than a throttling valve.

Boiler feedwater flow can be controlled by varying the speed of the electric motor that controls the speed of the pump and modulates the water flow to the boiler. By controlling flow using a variable speed drive, the electric motor uses much less horsepower and therefore less kilowatts as compared to the throttling valve. In this new control scenario, the feedwater valve should be 100% open or removed so to not restrict water flow. Since the throttle valve is no longer being operated, there is reduced valve maintenance cost.

For example, the boiler feedwater pump operating at 20% less flow (the pump operates 20% slower), can result in a 50% reduction in energy savings (based on the Affinity Laws).

Flow Control with VFD

What You Need to Get Started?

Rockwell Automation can help you assess/determine the feasibility and ROI for converting to variable speed drives for your boiler feedwater system.

- Operational data that correlates feedwater flow (valve position) to time of day (resolutions of 10 minute averages)
- Motor data – voltage, FLA, service factor, insulation class
- Pump data – need help to know what data
- Installation constraints – dimensions and environmental considerations

Begin Exploring Your Savings

Upgrading from valves to Allen-Bradley® PowerFlex® drives can provide immediate benefits for any plant. Maintenance and energy savings can be quickly realized. Additional operational improvements include increased boiler efficiency and plant availability.

By reviewing the historical operational data of your plant load conditions, Rockwell Automation can determine the payback schedule for upgrading your boiler feedwater system.

Energy Savings Calculator

Calculate your potential energy savings with the pump energy savings tool. This on-line tool is designed to compare conventional flow control methods with PowerFlex drives and show the differential power consumption of each. Realize the energy saving benefits of applying PowerFlex drives to your variable torque loads.

http://www.rockwellenergycalc.com

Reduce your operating costs, total cost of ownership and provide future expandability with full support services and solutions from Rockwell Automation.

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