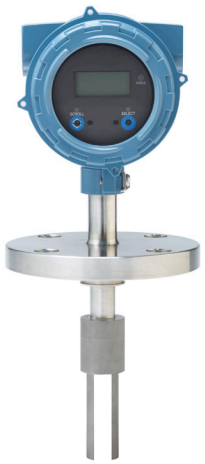
POWER INDUSTRY

COAL POWER PLANT IN COLORADO INSTALLS MULTIPLE MICRO MOTION FORK DENSITY METERS (FDM) TO MEASURE CONCENTRATION OF LIME SLURRY



RESULTS

Removed the barriers of mandated inspections, ongoing training and endless record keeping associated with nuclear densitometers

Reduced instrumentation costs by approximately 90% per meter

Eliminated operators going to the device to recalibrate equipment, increasing the safety of employees

Application

Calcium hydroxide, commonly called lime slurry, is widely used to remove acidic gas pollutants such as sulfur dioxide from the flue exhaust streams of coal-fired electric power plants. Exhaust enters the flue from the bottom of the tower and flows upward through a dense shower of lime. There, sulfur dioxide is absorbed by the lime and precipitated as wet calcium sulfite, which is often converted to gypsum and sold as a safe by-product. Controlling the usage of lime for coal-fired power plants is crucial in day to day activities.

Challenge

Nuclear densitometers are typically a single point calibration. The "nukes" may be accurately calibrated one week but if the process changes operators need to make adjustments to match the process fluid. For some nucleonic devices licensees who use a sealed source shall have the source tested for leakage at intervals not to exceed 6 months. The leak testing of the source must be performed using a method approved by the Nuclear Regulatory Commission (NRC) and State Regulations, and must be completed by a person specifically authorized by either regulatory agencies. Finally, record keeping, ongoing financial constraints and constant training all add to the requirements of utilizing a nuclear densitometer.

Solution

A coal power plant in Colorado chose to install multiple Micro Motion® Fork Density Meters (FDM) to measure concentration of lime slurry. Rugged and reliable, the FDM raises the standard for inline density and concentration monitoring plus it enhances the interface detection, concentration control and blending operations of process fluids.

The customer chose to install the FDM for not only the lower operating costs over nuclear densitometers, but for improved accuracy and operations. They installed each meter in a T-piece pocket at a 25° angle with 1" recessed from the pipe ID (See Figure 1), which allows the FDM to automatically drain solids, purge trapped air and flush solids if they

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get trapped in the pipe shroud at low flow conditions. (See MC-001976, Slurry Installations Best Practices for further details.). The angle was also chosen to ensure that the slurry within the pocket was constantly refreshed, which prolongs the lifespan of the vibrating tines of the meter because of the abrasive slurry. The customer also installed a manual flush line to clean the forks periodically. They are working to automate the flush process in their Ovation™ distributed control system (DCS).

Overall the customer received the following benefits:

• Micro Motion® FDM installed in the application removes the barriers of mandated inspections, ongoing training and endless record keeping associated with nuclear densitometers

• Easy, direct, simple, low costs installation – reducing instrumentation costs by approximately 90% per meter

• Improved quality control of lime, optimizing the desulfurization process costs by reducing waste of raw material with continuous real-time density measurement

• Good resistance to abrasive fluid with the Diamond Like Carbon coating (DLC). Benefits of DLC are a very low coefficient of friction and excellent durability

– resistant to impact/mechanical damage a high resistance to chemical attack

• Eliminates operators going to the device to recalibrate equipment to "match" the process fluid and thereby reducing trips into the plant to a minimum, increasing the safety of employees.

• Online diagnostic tools available through the Prolink III software application

Competitive Comparison:

	FDM	Nucleonic
Safety	• All welded construction • No moving parts • Easy-to-clean	• Non-environmental/health friendly technology • Many countries do not allow this technology by law
Cost of Owner-ship	LOW • No maintenance or moving parts • Minimum start-up and installation costs • Meter health diagnostics (KDV) as standard	HIGH • Periodic extra cost at source removal disposal and recycling • Yearly validation and associated paperwork • 3 times initial purchase cost, typically
Ease of Use	• Multiple outputs and communication protocols • Density, specific gravity, %concentration • 4-20mA's, time period signal, RS485, FOUNDATION Fieldbus, HART, WirelessHART	• Yearly retraining of the personnel • Specialized and certified 'nucleonic' engineers required • Licensing requirements
Perform-ance	• Repeatable measurement • Fast reponse to process change, 1-3 sec. typically	• Experiences problems with drifting measurement • Requires periodic meter adjustments • Slow response time, 10-30 seconds typically

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