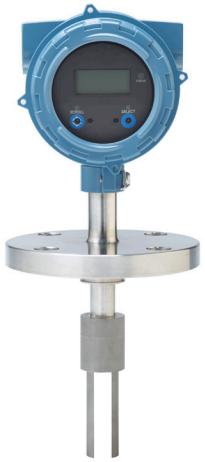
POWER INDUSTRY

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 and oil 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 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 typically use 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. In addition, record keeping and constant training add to the high costs 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 while enhancing 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

get trapped in the pipe shroud at low flow conditions. (See MC-001976, Slurry Installations Best Practices for further details.). The installation angle is designed to protect the vibrating tines from the abrasive slurry whilst continuously supplying fresh material to enhance measurement accuracy. 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, and simple, installation – reduced instrumentation costs by approximately 90% per meter
- Continuous real-time density measurement, improved quality control and reduced raw material waste in the desulfurization process resulting in lower operating costs.
- Good resistance to abrasive fluid with the Diamond Like Carbon coating (DLC). Benefits of DLC also include a very low coefficient of friction and excellent durability via resistance to impact or mechanical damage and a resistance to chemical attack.
- Employee health and safety are improved by reducing employee trips outside the control room to re-calibrate the drifting nuclear devices.
- 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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