



Measuring Rag Interface in a Process Separator



chemical

SIEMENS

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Challenge

Dow AgroSciences, a wholly owned subsidiary of The Dow Chemical Company, produces agricultural chemicals at its plant in Freeport, Texas.

The production process includes a series of wash vessels that prepare the chemicals for downstream processing. One vessel acts as a decanter or phase separator. In the phase separator, a chemical mixture stratifies into the organic herbicide product on the bottom, a top layer of inorganic by-product, and a middle layer of fragmented rag. Rag and inorganic layers are decanted through the top of the vessel and organics are piped out the bottom. For smooth plant operation, it is critical to monitor and control the various layers.

"If rag and inorganics flow out of the bottom of the vessel, it can plug up our distillation towers, resulting in downtime and added cleaning costs," said Herb Michael, Technical Associate from Dow's Ag-Halopyridine Technical Center which supports the Freeport plant. "Over the years, we have tried several level and interface measurement devices, but we have been unhappy with the results. We found conventional capacitance probes were sensitive to moisture, product build-up, and variations in temperature and pressure. They frequently required cleaning and re-calibration. It was costly, time-consuming and unreliable."

Solution

In early 2002, Dow's instrument and electrical technicians worked with Siemens Milltronics representatives to develop a reliable solution. They installed an Echomax® XPS-10 ultrasonic transducer with a MultiRanger® monitor to measure top level in the vessel.

Key to the solution was the installation of two SITRANS® LC 500 capacitance instruments to measure interface. One measures the top interface of inorganics to rag, and the second measures the interface between the bottom layers of organics and rag. Effective monitoring of the layers ensures proper balance within the vessel and facilitates smooth processing. To accommodate the harsh chemical conditions, the SITRANS LC 500 instruments have a Hastelloy® B-3® probe. The 2-wire, loop-powered transmitter was quick to install, and push-button calibration made set-up easy. The output signals are integrated into the control system for continuous monitoring.

Patented Active-Shield technology isolates the active-shield so it is not affected by changes in vapor concentration, material build-up, dust or condensation. This means reliable, accurate level detection, even in harsh conditions. SITRANS LC 500 reduces the starting capacitance to that of the customer-designed sensing element, so the interface measurement is unaffected by the process layers outside the sensing range. This provides the most reliable interface measurement for the mechanical given span. As a result, unlike traditional devices, SITRANS LC 500 does not require frequent cleaning or recalibration.

Benefits

Maintaining a smooth, continuous process maximizes the plant's productivity by avoiding spillage, system clogging, or process upsets. It ensures that only organics exit from the bottom of the vessel and only inorganics and rag are drawn off from the top.

"Siemens suggested a very innovative approach that has improved our process and cut our costs," said Herb Michael. "Eliminating downtime increases our throughput and saves us money on cleaning and maintenance costs. The cost of these instruments is a fraction of other options such as nuclear that don't give us as much information."



Reliable interface measurement helps Dow maximize productivity in its agricultural products plant in Freeport, Texas.