Case Study • 2005

Radar Instrument Handles Corrosive Environment

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SIEMENS

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Challenge

IOCHEM Corporation operates an iodine-extraction plant near the town of Vici in western Oklahoma. The plant employs 30 people and is one of only a few iodine producers in the world.

IOCHEM extracts iodine-bearing brine from subterranean wells that reach 10,000 feet deep. The brine is pumped into large, open-topped, plastic-lined storage tanks that stretch 20 feet high with a 70-foot diameter. The brine temperature ranges from 50 to 60 °C (120-140 °F), and the storage conditions include brine vapors and a constant brine spray. The crude iodine is shipped to customer companies that refine and process the iodine and derivatives for the commercial market.

Continuous level measurement is essential on the brine storage tanks to alert operators of a high-level or low-level condition so they can adjust throughput and avoid a spill.

IOCHEM had employed a transmitting strapping gauge for this application but it was not reliable and required a lot of maintenance, so the company sought an alternative. IOCHEM tried a competitor's ultrasonic transmitter but it simply could not perform the measurement. A competitor's radar device was installed but the output signal was not stable at high-level conditions, and the unit failed shortly after installation. The corrosive iodine attacked and destroyed the radar unit's aluminum enclosure and electronics.

Solution

Donnie Randall, Plant Foreman at IOCHEM, contacted Bob Murray of Lucas Controls Company, Inc. to ask for advice. "I contacted Siemens Process Instruments in Grand Prairie to discuss the options," said Murray. "Given the extremely corrosive environment, we determined the best approach was the new SITRANS® Probe LR level measurement instrument."

The SITRANS Probe LR is a 2-wire radar transmitter designed for use on liquid storage tanks or simple process vessels. It's ideal for applications with chemical vapors, temperature gradients, vacuum or pressure, such as tank farms, chemical storage and digesters. It has a plastic enclosure and a patented uni-construction polypropylene rod antenna with an integrated threaded connection that is hermetically sealed for superior chemical resistance. The low frequency of 6.3 GHz (5.8 outside North America) offers high immunity against condensation or deposits, which is important for liquid storage applications. Its very high signal-to-noise ratio is comparable to 4-wire devices. It's quick and easy to set up and program, and has advanced echo-processing techniques such as Sonic Intelligence® and Auto False-Echo Suppression built in.

Benefits

After six weeks in service, the Probe LR proved its robustness. The display window is discolored by the iodine brine and brine crystals are growing on it, but the radar unit is working well, providing reliable, continuous level measurement. During that time, the instrument weathered a lightning storm, which knocked out the existing strapping gauge. The failed gauge was not returned to service and the Probe LR is now on its own, showing the company's faith in its performance.

"We are very happy with our Probe LR," said Randall. "It gives us an accurate, stable output signal, and it does what it is supposed to do despite where it has to live."

Donnie Randall, Plant General Foreman at the IOCHEM plant near Vici, Oklahoma, is pleased the SITRANS Probe LR has solved the need for reliable level measurement on the iodine brine tank.

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