



Self-Cleaning
Antenna Solves Level
Measurement Problem



chemical

SIEMENS

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Challenge

H.C. Starck GmbH, headquartered in Goslar, Germany, is one of the world's leading manufacturers of metal, carbide and ceramic powders. Founded in 1920, H.C. Starck has been a member of the Bayer AG group of companies since 1986.

The company is known for its high quality products used in metallurgy and metal processing, optics, electro-technology, electronics, welding, thermal spraying, advanced ceramics, catalysts, and batteries.

The plant at Goslar faced a challenge in achieving reliable level measurement on several production lines. Many of the process vessels operate under extreme conditions with high temperatures, encrustation and deposit on the tank wall and tank roof, extreme foam layers and agitation.

In the dioxide production line, for example, all of the level measurement devices that H.C. Starck tried, failed after about eight hours and needed to be cleaned. This resulted in significant cleaning cost and downtime. The application is a challenging one, involving harsh chemicals - chalk milk, acids, hydrofluoric acids, and sulphur at high temperatures of 100° C (212° F). The process generates vapor, foam, steam and heavy product deposits. The 4-foot diameter reactor tanks have an agitator, and the mixing process creates a turbulent surface.

The company needed a more reliable solution for measuring level and volume that could cope with the encrustation problem. The answer was a radar instrument with self-cleaning capabilities.

Solution

In 2000, H.C. Starck installed a Siemens Milltronics® radar instrument on a dioxide reactor for a one-week trial. The radar instrument, mounted on the top of the tank, was equipped with a 6-inch horn antenna and a purging system. It was easy to install. It was simply positioned on the nozzle, bolted in place, and connected to the power supply. It was fully operational using standard parameters.

In this application, the horn helps protect the antenna against material splashing and build-up. The mounting flange has a special 1/8 inch inlet for a purging line which periodically shoots hot steam (in other applications, it may be water or solvent) at an angle against the horn, creating a swirling motion that flushes material build-up from the antenna. The installation was configured for automatic control. The purging is activated together with a valve and an automatic time control system.

SITRANS® LR 300 uses advanced microwave pulse technology to provide continuous level measurement in liquids and slurries, even in extreme process conditions. With its low frequency and high signal transmission speed, it is virtually unaffected by temperature or pressure extremes, steam, dense foam, vapors, condensation, dust, aggressive chemicals, encrustation, turbulence and agitation. It features patented Sonic Intelligence® signal-processing technology for superior reliability. The high signal-to-noise ratio delivers reliable performance in dynamic conditions and offers enhanced reliability over 2-wire systems that often lack the power to process and respond quickly, especially on low dielectric materials.

Benefits

Even in the harsh, demanding conditions of this reactor tank, the instrument provided reliable, accurate continuous level measurement where all other measurement devices had failed.

The purging kit cleans the antenna without interrupting the process. Eliminating the cleaning downtime represents a major cost saving and enhanced efficiency. Estimated savings of avoided cleaning and downtime are up to 100,000 Euros a month.

Following the successful trial, H.C. Starck has installed more than 40 radar instruments in its plant on various production processes.



The Siemens radar instrument provides reliable level measurement even in the harsh conditions of this dioxide reactor tank, using a purging kit to periodically clean the antenna without interrupting the process.