SIEMENS

MultiRanger 200 and Echomax transducers

Precise biogas measurements around the world

With a growing population requiring increased energy resources, biogas is a renewable alternative to fossil fuel consumption. Biogas is created through the gasification of slurries, biological waste, and biomass. Once generated, however, it cannot easily be compressed and stored in liquid form, so intermediate storage is indispensable.

One widespread method of storing biogas is a double membrane gasholder (DMGS). Both the outer and inner shell membranes are composed of PVC-coated polyester fabrics; the outer protects the structure from weather conditions such as wind or snow, and the inner membrane contains the biogas.

Air is blown under the outer membrane of the gas storage, creating an overpressure environment that keeps the outer shell stable and protects the biogas. [Figure 1]

Sattler AG in Austria is a leading manufacturer of double membrane gasholders. Founded in 1875 by August Sattler, the company has gained an international reputation in industrial fabric manufacturing.

Together with its German subsidiary Ceno Membrane Technology GmbH, Sattler AG has been building gas tanks for a wide range of applications for more than 30

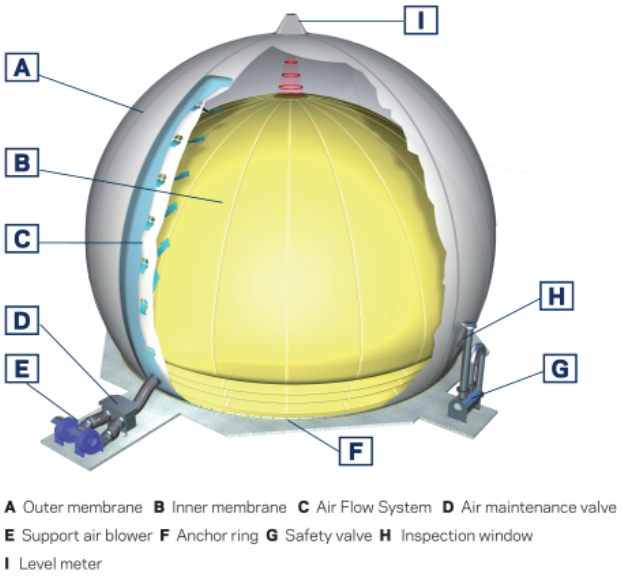

Figure 1: Structure of a double membrane gasholder. Siemens Echomax ultrasonic transducer is mounted on the outer membrane (I).

Sattler AG offers a range of gasholders designed to suit customers' plant concepts.

years. In fact, the double membrane gas tank system can be found in countries around the world.

Challenge

Knowing the exact fill level of the gasholder is necessary for its operation. As the inner membrane inflates and deflates based on the amount of biogas it contains, level measurement technology is essential for monitoring the level of the inner membrane. A few years ago, Sattler AG searched for a non-contacting measurement technology for this task.

When dealing with gaseous fuels, measurement accuracy is essential. Using a mechanical device such as a measuring rope can create increased maintenance needs, as moving parts require servicing and cleaning. Non-contacting measurement devices such as an ultrasonic system combine accuracy with low maintenance requirements.

Solution

After extensive testing of various suppliers and measuring technologies, Sattler AG opted for Siemens ultrasonic devices for these measuring tasks.

The MultiRanger 200 ultrasonic controller, together with an Echomax XPS-15 transducer, is now mounted on gasholders with a height of 10 meters (32.8 feet). The taller tanks are equipped with the SITRANS LU01 ultrasonic controller and an Echomax XPS-30 ultrasonic transducer.

The ultrasonic transducers are center-mounted on the top of the outer shells using integrated mounting brackets. The transducers emit a sound burst, which is reflected by the inner gas membrane and sent back to the transducers. The MultiRanger 200 and SITRANS LU01 controllers calculate the distance, converting it into a continuous level measurement. The controllers can either be mounted on a panel, in the control room, or directly on the gasholder (in a non-hazardous zone).

Benefits

Siemens Echomax transducers do not require any maintenance and their self-cleaning capability removes any condensation or contamination, making them ideal for an outdoor application such as this.

The MultiRanger 200 and SITRANS LU01 controllers feature patented Sonic Intelligence software, which ensures reliable level measurements even in changing operating conditions.

Programmable relays are another advantage of this ultrasonic system. These can be programmed as set points or for alarms such as loss of echo, cable break, and short circuit. They can also be integrated in the control for further processing. Volume can be calculated directly by the controller, requiring only very simple programming.

Only a few parameters must be set to get the devices started. Sattler AG has prepared a standard parameter set for all gasholders, so operators can enter the set into

The MultiRanger 200 provides continuous and precise level monitoring for Sattler AG's gasholders.

External storage of helium for the airship in the Kalahari Desert.

the devices via the handheld programmer or Simatic PDM software. Hence, the devices can be programmed before delivery to the final customer, reducing commissioning times on site. Parameter sets can be saved, duplicated, and printed. Many diagnostic functions are available, such as viewing an echo profile and error messages.

As Mr. Bruno Pirer from Sattler AG states, "The SITRANS ultrasonic devices have been the first choice for our measurement task for many years. They work with highest reliability and are easy to program. The maintenance-free transducers are ideal for our application. The combination of our gasholders with Siemens ultrasonic level measurement technology has perfectly proven itself in plants around the world."

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