

CONTINUOUS LEVEL MEASUREMENT OF COKE DRUMS

Ronan Measurements Division supplies the process control industry with leading-edge Radiometric Measurement Systems that provide non-contact measurement solutions for the harshest environments.

RONAN'S CONTINUOUS LEVEL RADIOMETRIC MEASUREMENT SYSTEM

Application

Coke Drum Management is a critical function at any Refinery. Operators must balance minimizing the risk of foam carryover with maximizing fill to maximize production and throughput. During the conversion process, foam is created in varying amounts. If the foam reaches and enters the vapor lines, production has to be stopped and an extremely expensive clean-down operation must be carried out. In addition, maximizing fill is crucial to ensure maximum revenue and equipment life.

Problem

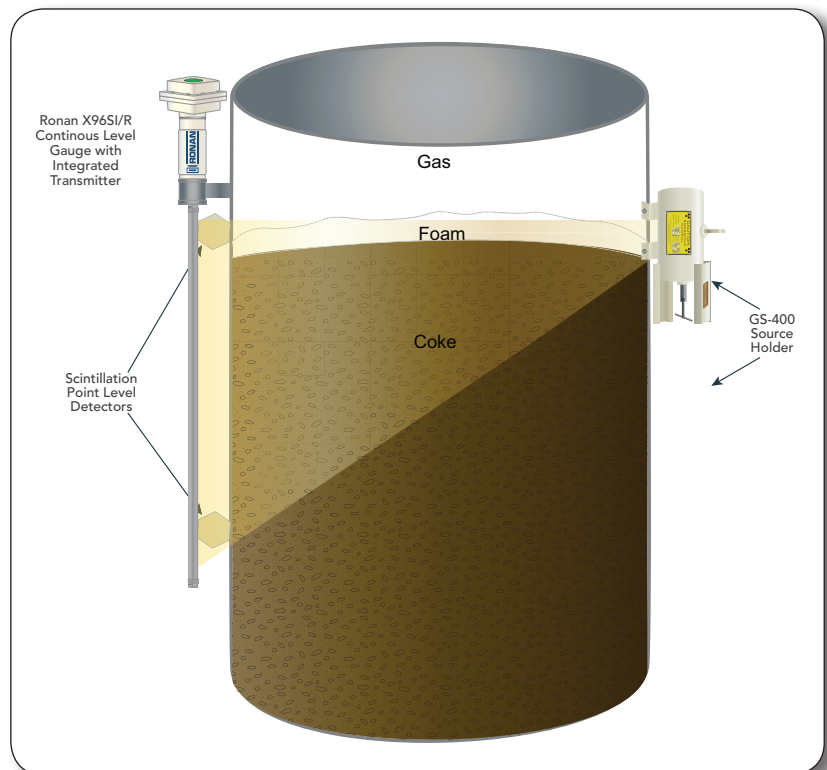
Level measurement of foam and coke is critical to control the spraying of defoamer, and eliminating foam from clogging the vapor filters. Alternative methods of measurement, such as Neutron Backscatter, have been used to monitor levels within coke drums but these methods do not offer full control. "Dead zones" between level detectors delay response times, causing operators to only fill coke drums to 80% of capacity, reducing efficiency in operation and sacrificing revenue. Other methods of monitoring level cannot be used due to the high temperature of the coke drums and the severity of the coking process, which would damage any measurement sensor placed within the drum.

Solution

Ronan's Continuous Level Measurement System, including the X96SI/R Radiometric Transmitter with FlexDetector™ and Point-Level Detectors for high and low-level monitoring, is an ideal solution. The X96SI/R provides continuous measurement for the top 40 feet of the tank, enabling operators to fill tanks up to 98% of capacity which provides 20% increased throughput. In addition, operational costs are decreased by reducing the amount of defoamer used, eliminating the need to heat the drum, and minimizing wear of plant equipment. The system is not affected by changes in vapor density.

Summary

Employing the Ronan Continuous Level Measurement System enables continuous online monitoring of Coke Drums, reducing the risk of costly foam overs while allowing users to reduce operating costs, increase throughput and maximize productivity.



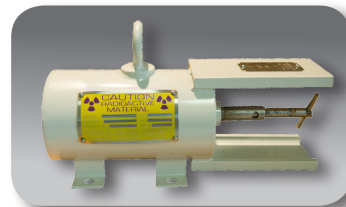
CONTINUOUS LEVEL RADIOMETRIC MEASUREMENT SYSTEM

GS-400 Source Holder

The Ronan GS-400 Source Holder is a fireproof-rated design which mounts externally to the pipe or vessel. With a collimation angle of up to 90 degrees, this source holder is ideal for continuous level applications where multiple sources would normally be required. The GS-400 is available in a variety of sizes, providing shielding which meets all international standards for radiation limits, and accommodates up to 10 Curies (370 GBq), CS-137 and 2 Curies (74 GBq), Co-60.

Other features include:

- Ductile Iron with epoxy paint as standard; available in Stainless Steel or PVC coated ductile iron as options for harsh environments
- Fireproof design
- Manual Rotary Shutter standard; options include: Shutter Position Indicator Contact Output, Air or Electric Actuated Shutter with Position Indicator Contact Output



Scintillation Detector

Ronan pioneered the use of solid crystal scintillation detectors more than 20 years ago, and now has an installed base in the thousands across a wide variety of applications worldwide. Ronan employs two types of solid crystals, Scintillating Plastic Crystals for standard applications and Sodium Iodide scintillating crystals. Scintillation Detectors provide efficient detection, enabling the use of lower-level sources.



X96SI/R Radiometric Transmitter with FlexDetector™

The X96SI/R is compatible with all Ronan scintillation detectors. The new integrally-mounted, explosion-proof transmitter includes a patented optical coupling that allows the transmitter and detector electronics assembly to be easily mounted to any detector configuration. The transmitter can also be remotely mounted in the field or control room. Fully Ethernet capable, configurations, software updates, and data logging can be completed easily through the user's PC using a standard web browser. The system is backward-compatible to enable you to easily upgrade existing systems to newer transmitter technology. Built-in intelligence provides a range of features including:

- Automatically compensates for vapor density changes, foam, gasses, process build-up
- Automatic source decay compensation
- Auto calibration
- Radiation discrimination
- State of the art dynamic tracking of process fluctuations
- Data logging and event recording
- Adjustable time constant
- Empty vessel alarm

The patented FlexDetector utilizes a non-hazardous, non-flammable scintillating fill-fluid, which is doubly encapsulated and protected by an outer sheath of armored conduit. This newest flexible design offers unique advantages in reliability and sensitivity while the lightweight construction eliminates the need to employ cranes and rigging for installation. This design is ideal for horizontal or spherical vessels, or parts of the vessels where space is limited.

