

# CONTINUOUS LEVEL, POINT LEVEL AND DENSITY MEASUREMENT FOR OIL DRILLING AND EXTRACTION APPLICATIONS

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 RADIOMETRIC MEASUREMENT SYSTEMS

### Application

In harsh environments, like oil drilling and extraction, making accurate process measurements can be difficult. Ronan Instrumentation can solve the most challenging measurement problems including:

- **Continuous Level Measurement** to measure liquids or solids contained in a vessel, even one with an internal structure.
- **Point Level Measurement** for detecting and indicating the presence of material relative to a pre-selected level in process tanks, hoppers, chutes and vessels.
- **Density Measurement** for continuous density measurement of liquids, slurries, and solids contained in a pipe or vessel.

### Problem

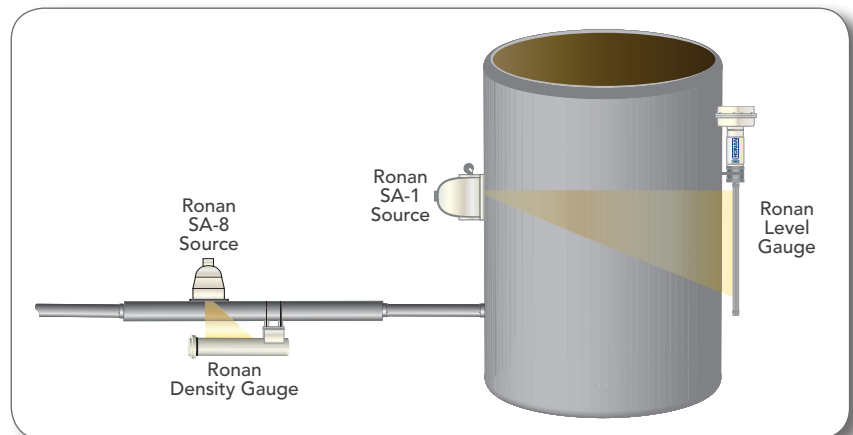
When process material to be measured is corrosive, explosive, abrasive or highly viscous, under high pressure or in a flow that is violent or constantly changing, or when material is contained in a vessel with an internal obstruction, traditional measurement techniques can provide unreliable results, and are often impossible to implement.

### Solution

Radiometric Measurement provides a safe and efficient non-contact method to measure liquids and solids in harsh process environments. A Radiometric Measurement System consists of a gamma Source and Source Holder, Detector and Transmitter. The gamma Source is mounted externally to the vessel and emits energy through the vessel walls, directed towards the detector, also mounted externally, on the opposite side of the vessel. The gamma energy reaches the detector in an inversely proportional relationship to the level of material in the vessel. The detector measures the amount of energy and sends a signal to the microprocessor, which correlates the signal to a measurement and displays the information in user-specified units. Because the entire system mounts externally to the vessel or pipe, it can be easily installed and maintained while the process is running without downtime, vessel modifications, risk of accidental release, or the need for specialty construction materials.

### Summary

When traditional measurement techniques won't work, Radiometric Measurement provides a safe and viable solution. Ronan Measurements Division offers the widest variety of Source Holders and Detectors on the market, including Source and Source Holders to meet every need, Detectors configurable to any shape or length, and a new integrated, explosion-proof Transmitter that is approved for a wide variety of extreme environments including Class I, Div 1; Class II, Div 1; Class III; Type 4X; Class I, Zone 1; AEx; and ATEX.



Typical Continuous Level and Density Radiometric System



## RADIOMETRIC MEASUREMENT SYSTEM

### **SA-1 General Purpose Source Holder**

The SA-1 is a rugged, general purpose source holder suitable for a wide range of applications requiring an externally mounted source. The SA-1 provides shielding which meets all international standards for radiation limits, and accommodates source activity up to 5 Curies (185 GBq) CS-137 or 18 mCi (0.67 GBq) Co-60.

Features:

- Available in Ductile Iron cast with epoxy paint as standard; also available in stainless steel and PVC-coated ductile iron as options for harsh environments
- Lead-free option Available
- Fireproof design available
- Manual Rotary Shutter available as standard; Shutter Position Indicator Contact Output, Air or Electric available as options
- Actuated Shutter with Position Indicator Contact Output



### **Integrated X96SI/R Radiometric Transmitter with FlexDetector™**

The new integrally mounted X96SI/R Radiometric Transmitter includes a patented optical coupling that allows the transmitter and detector electronics assembly to be easily mounted to any detector configuration. Explosion-Proof Housing is certified for most environments including: ATEX; Classified; Class I, Div 1; Class II, Div 1; Class III, IECEx. 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 upgrade existing systems to newer transmitter technology. Ronan Transmitters are compatible with any I/O including: Ethernet, HART, Profibus PA and Fieldbus, USB port, 4-20 mA or 0 – 10 v.d.c., Relay(s) output, and Transistor type.

State-of-the-art transmitter-based electronics provides precision gauging. The system is menu-driven for simple programming. Built-in intelligence provides a range of features including:

- Automatically compensates for vapor density changes, foam or 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 pipe alarm

The patented FlexDetector utilizes a non-hazardous, non-flammable scintillating fillfluid, 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.

