CRUDE OIL METERING

Crude oil metering is an important application for all the stages right from exploration to production till refining. There are a few challenges for measurement like accuracy, repeatability, handling changing viscosities and turndown. Inline Ultrasonic Flowmetering technology offers a complete solution for crude oil metering with unique features that make this technology the most preferred.

Crude Oil flow needs to be measured at various locations on its route from the exploration well to production facility to the refinery. These locations are: after separators, inlet or outlet of cross-country pipe line, ship loading and unloading, inlet of refinery crude oil supply line, crude oil blending system, refinery internal circulation, inlet to production column and FCC feed.

Worldwide, KROHNE has thousands of installations of inline Multi-path Ultrasonic Flow Meters for all the applications mentioned above.

What makes Inline Ultrasonic Flow Metering the most suitable technology for Crude Oil Metering?

• Non intrusive in-line spool type multi-beam design. Hence, no pressure drop across the meter.
• No moving parts. No wear and tear. No chance of clogging.
• Fluid properties have no effect on meter performance. Thus, can be used for multi-viscosity and varying density crude oils.
• State-of-the-art 3 beam design offers consistent performance even in dynamic flow profile conditions.
• High accuracy over a wide measurement range.
• High turndown ratio - starts measuring from zero flow.
• Bi-directional flow measurement.
• Low cost of ownership.
• Available in sizes from 1” to 80” – hence one type of meter for all ine sizes.
Ultrasonic flowmeters for Crude oil applications

**Pipeline transportation and storage**

Crude oil is transported from production to intermediate storage and then refineries. Many times crude oil has high wax or paraffin content. Varying viscosities are also a challenge for metering. Coagulation of this wax on flowmeter walls and varying viscosities causes huge problems to mechanical meters.

These issues can be sorted out by ultrasonic flowmeters with integral steam heating jacket which prevents wax coagulation on flow meter walls. KROHNE inline ultrasonic flowmeters have been successfully installed on such applications in OIL, BRPL, IOCL, NRL etc.

**Offloading Crude oil from ships**

Crude oil is transported by ships from one location to another. The loading and offloading of crude oil at ports and refineries require accurate, repeatable and at times Custody Transfer Fiscal metering. Inline ultrasonic flowmeters with all the advantages mentioned earlier offer the best solution.

**Inline ultrasonic flowmeters for Crude oil blending**

Many refineries buy crudes from different locations for refining. Crudes from different locations have different properties. These crude oils are blended in a particular proportion to achieve process stability and the desired quality of final hydrocarbon products. Inline Multi-path Ultrasonic Flowmetering technology is the most preferred for this application because of the following advantages:

- Ability to deliver accurate measurement, with excellent repeatability despite varying viscosities and densities
- Large turndown even at high viscosity conditions.

The other benefits of online blending using Inline ultrasonic flowmeters are:

- Improved efficiency of blending activity
- Mixing tanks can be freed for storage
- Rapid production rate
- Reduced cost

**Ultrasonic flowmeters for Custody transfer metering of Crude oil**

KROHNE inline ultrasonic flowmeter models Altosonic III and Altosonic V are NMI approved for custody transfer metering. Accuracy and repeatability are the most crucial metering parameters for custody transfer. KROHNE inline ultrasonic flow meters handle multiple viscosity crude oils without any effect on accuracy and repeatability. The meters do not drift and thus, no recalibration is required. Bidirectional custody transfer metering, high rangeability, absolutely minimal maintenance requirement, are a few characteristics of the inline ultrasonic flow meter that make it the perfect solution for custody transfer metering of crude oil. KROHNE provides a complete custody transfer metering solution as duty/master meter configuration. KROHNE not only supplies Custody Transfer meters but also supplies custody transfer metering skids or systems along with the Prover, Autosampling and Supervisory Computer System as a complete end-to-end system.