Industry: Minerals Processing

- **Magnetite Flows in the Beneficiation Process**

CiDRA® Minerals Processing

Application Note

SONARtrac® SOLUTIONS

The *SONARtrac* Volumetric flowmeter uses a Sonar-based measurement approach to overcome the limitations of other flowmeters (electromagnetic and ultrasonic doppler), while providing a lower total cost of ownership.

Benefits

- Naturally immune to magnetite – the *SONARtrac* meter does not require recalibration with varying densities or mixture changes
- Works with most types of pipe – steel, PVC, HDPE, lined, unlined, etc.
- Works with any level of solids – from clean fluids to the highest density slurries without a need to recalibrate
- Non-contact design eliminates abrasive wear providing a long life
- Clamp-on design allows installation without a costly process shutdown

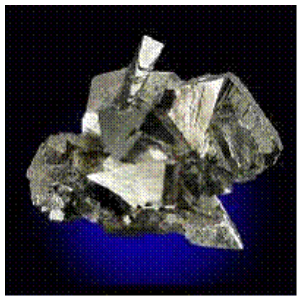
The *SONARtrac* volumetric flowmeter overcomes the shortcomings of other flowmeters. For example: magnetite density and mixture changes cause signal instability and erroneous readings in electromagnetic flowmeters and ultrasonic doppler flowmeters are not known for their accuracy in high density slurries or stability under changing conditions.

Process

Iron ore beneficiation processes and other mineral processing operations with magnetite in the ore require accurate mass flow measurements to properly balance the grinding and separation circuits as well as to determine the true throughput impact of circuit changes. Determination of the mass flow requires an accurate measurement of the volumetric flow rate and the specific gravity of the slurry.

Challenge

Despite their shortcomings, electromagnetic flowmeters and ultrasonic doppler flowmeters have been traditionally used to measure magnetite slurry flows.



Until the introduction of the *SONARtrac* meter, they were the only viable flowmeter options for magnetite slurries. The accuracy and long term stability of ultrasonic doppler flowmeters in these applications is suspect. For electromagnetic flowmeters, the magnetite in the slurry affects the electromagnetic field used to measure the flow, potentially causing large errors in the flow reading. If compensation for magnetite can be implemented, it is usually limited to certain ranges of magnetite. In the presence of larger slurry particles, the abrasive nature of these particles causes rapid wear of the flow tubes and electrodes leading to premature meter failure and loss of needed flow measurements. Electromagnetic flowmeter failures also lead to unplanned maintenance and replacement events, and costly meter replacement.

SONARtrac Solution

The *SONARtrac* volumetric flowmeter overcomes the shortcomings of other flowmeters, thus providing accurate, stable volume flow readings, along with a long meter life and overall lower total cost of ownership. In applications with magnetite slurries, concentrator and pelletizer plant operators have been replacing doppler and electromagnetic flowmeters with the *SONARtrac* flowmeter. The *SONARtrac* flowmeter is used to monitor:

- Concentrate lines
- Tailings lines
- Hydrocyclone feed lines
- Hydrocyclone overflow lines
- Mill feed lines
- Mill discharge lines

The *SONARtrac* flowmeter easily clamps onto existing pipes and does not require a process shutdown for installation or calibration. It is easily removed and replaced on the pipe during pipe replacement actions.

SONARtrac® Technology

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