



APPLICATION NOTE Minerals & Mining

Volume Flow Measurement of Abrasive Slurry at a Large Gold and Copper Facility

- Costs savings due to a reduction in production losses and much lower replacement rate of flowmeters
- KROHNE support in selecting appropriate materials and application engineering
- Rugged polyurethane liner offers excellent resistance to wear with highly abrasive slurries

1. Background

A large gold and copper facility in South East Asia uses electromagnetic flowmeters in its hydrocyclone inlet feed lines. Hydrocyclones are used for the classification of particles in slurries. Relatively light particles are removed with the overflow stream by an upward swirling flow through the vortex finder, and heavier particles are removed with an underflow stream by a downward swirling flow. The value of the total gold production throughput, passing through the four hydrocyclone feed lines, is approximately \$3 Million USD per day.

2. Measurement requirements

In each of the four hydrocyclone feed lines an electromagnetic flowmeter is installed. One of the main selection criteria for flowmeters is minimal maintenance with high measurement integrity over a long period of time. Coarse and fine materials cause major abrasive wear. The maintenance costs of the flow control are driven by the costs of replacing a flowmeter. This not only involves the acquisition price of a new meter, but also includes production downtime, manpower, crane time, the flanging and installation of new flowmeters. Secondly, maintenance costs are driven by the frequency of replacements. The use of inappropriate materials can lead to a meter replacement frequency of three to six months per line. At best a six month replacement frequency will cost the facility \$450K USD per line per year in production losses and \$50K USD for the meter replacement per line per year.

3. KROHNE solution

Through appropriate material selection and application engineering, KROHNE has been able to reduce the replacement frequency of the electromagnetic flowmeters from every 6 months to 3 years. The flowmeter of choice is an OPTIFLUX 4300 with a polyurethane liner combined with Hastelloy C electrodes. The meter construction and liner provides the necessary toughness and versatility sought by a customer to maximize the instrument life in such a severe application like cyclone feed lines. The rugged polyurethane liner has an excellent abrasion resistance. The flush mounted Hastelloy C electrodes create less obstruction in the flow and therefore are less subject to wear and noise. The electrodes have a carbide coating which is extremely durable for an extended lifetime. The inner diameter of the flowmeter exactly matches the inner diameter of the connected process pipes. With abrasive applications, even the smallest difference in inner diameter can accelerate wear. The last measure taken is the installation of type 3 protection rings on the inlet of the flowmeter to prevent a difference in the inner bore.

The IFC 300 signal converter offers intelligent noise filtering techniques. The integrated process diagnostic functions of the IFC 300 can be used for appropriate parameter setting and provides information on the status of the sensor, the converter and the process.

4. Customer benefits

Based on years of experience in the minerals and mining market, KROHNE has given engineering support in selecting the best solution. This has led to a substantial reduction of maintenance costs and increased the uptime for the customer. Smart material selection has allowed for an important extension of the meter lifetime from 6 months to every 3 years. KROHNE has been able to save the facility \$1.5M USD per line every 3 years.

Reliable flow control has an impact on the throughput and efficiencies for mining and minerals processing and can therefore lead to major reductions of production costs. The customer has seen the value of investing in technology that extends the meter lifetime.

5. Product used

OPTIFLUX 4300

- A rugged polyurethane liner with an excellent abrasion resistance
- Flush mounted Hastelloy C electrodes with carbide coating for less wear, less noise and no obstruction in the flow
- Type 3 protection rings to prevent further difference of inner bore which can accelerate wear



Contact

Would you like further information about these or other applications?

Do you require technical advice for your application?

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