Increased Throughput, Reduced Maintenance Costs for Alumina Refinery

BENEFITS

- Exceptional accuracy and reliability
- Excellent corrosion resistance
- 4–20mA output of true online density
- Increased production efficiency

APPLICATION

Alumina (aluminum oxide) is a white granular material refined from bauxite ore using what is called the Bayer process. The ore is ground and mixed with lime and caustic soda, and this slurry is heated in a high-pressure digester. The aluminum oxide is then dissolved by the caustic soda, separated, and precipitated out of solution. It is then washed and heated to drive off the excess water, leaving the white alumina powder.

CHALLENGE

The mix of bauxite and caustic soda fed into the digester determine the digestion parameters. The simplest method of control is to maintain stable digester conditions and manage the composition of the slurry to achieve the optimal mix for those conditions. The slurry density is a critical component of monitoring this mix.

A major alumina refinery had historically used nucleonic density meters for this measurement. These meters suffered from poor accuracy and the need for frequent maintenance. Furthermore, tighter regulatory restrictions on the use of nucleonic instruments was a constraint on their continued operation.

SOLUTION

The refinery replaced one of its nucleonic density meters with a Micro Motion Dedicated Density meter. The Micro Motion meter uses a vibrating fork design that has no moving parts, is virtually maintenance-free, and is tolerant of a wide range of process conditions. This meter was able to provide a highly-accurate, real-time density measurement. Combined with its integrated temperature sensor, and a conductivity measurement taken earlier in the pipeline,

Since its installation, the Micro Motion density meter has continued to operate with excellent performance.

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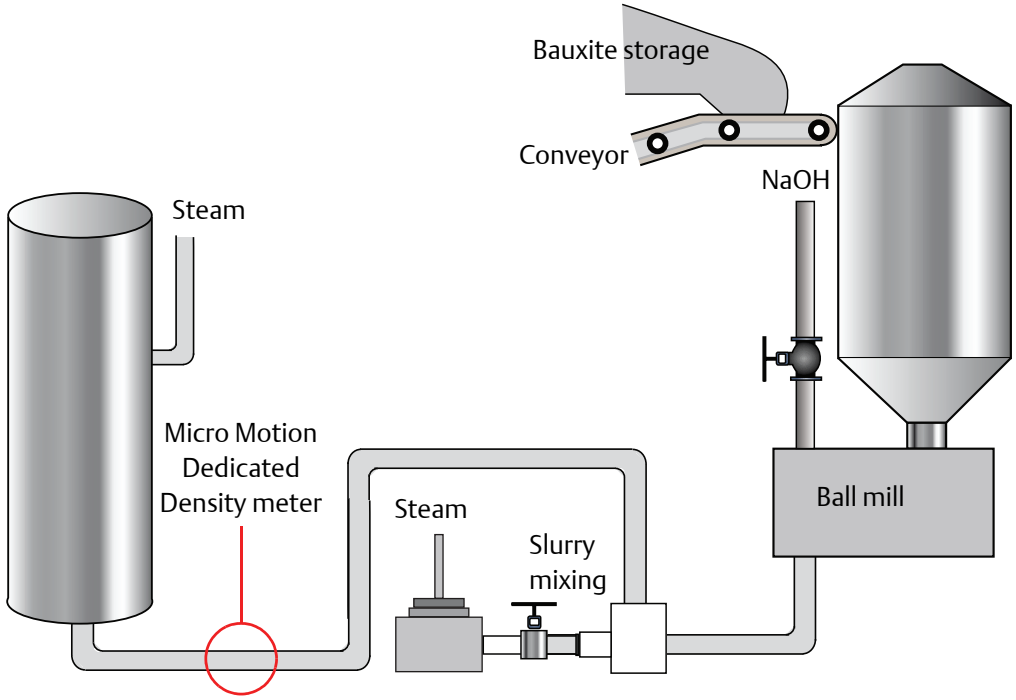
the density measurement allowed the refinery to control the slurry mixture much more precisely and more reliably than they had been able to before. Since its installation, the Micro Motion density meter has continued to operate with excellent performance. The refinery has seen increased throughput and reduced maintenance costs as a result.



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