CASE STUDY

Measurements are reliable, stable and **environmentally** friendly through the precision of the acoustic impedance of **ultrasound waves**.

Case Study - Pan American Silver, Chile

Introduction

The gold extraction mining plant, jointly operated by Pan American Silver, is located in the Antofagasta region of Chile. The plant has a capacity of 4200 tonnes per day and employs a metallurgical process to extract gold from minerals. The process involves several stages, including a crushing-grinding circuit and agitation cyanidation leaching in tanks. The key goal of the process is to achieve the extraction of Doré metal using the Merrill Crowe process and subsequent smelting of precipitates.

Challenges

In copper sulfide operations involving processes such as grinding, flotation, thickening, and filtering, density measurement has conventionally relied on the use of radioactive isotopes. However, there is currently a notable shift among users of this technology who are actively seeking alternatives. This shift is motivated by valid concerns regarding health and environmental regulations that govern the use of radioactive isotopes in such operations.

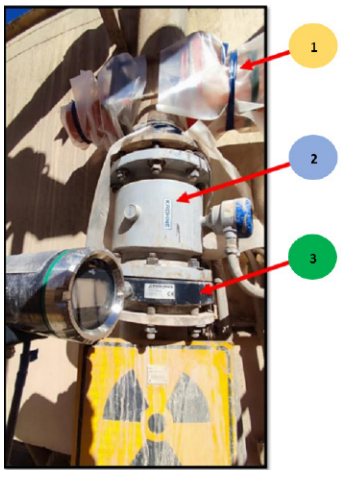
The challenge is to test the Slurry Density Meter's capabilities in contrast to that of the nuclear density meter to determine accuracy and reliability. The primary thickener is where the intentional performance test of the non-nuclear density meter is conducted.

Measuring tasks

The underflow discharge from the thickener is pumped at a solids concentration of 50-60% to the center of two agitators arranged in series. The solution is introduced into the first tank to ensure that the slurry maintains a solids concentration of approximately 50%.

Instrument used

To address the objectives of the study, the SDM was installed and assembled inline via an 8-inch HDPE Wafer. Simultaneously, an existing nuclear density meter was mounted above it.



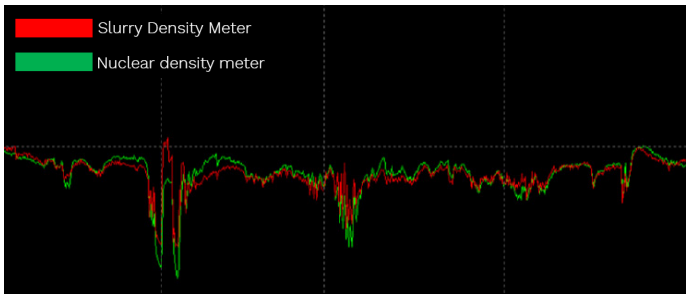
1: Nuclear density meter
2: Magnetic flow meter
3: Non-nuclear SDM

This setup allowed for a direct comparison between the trusted nuclear density meter technology and the innovative Slurry Density Meter (SDM) developed by Rhosonics. By conducting this comparison, the study aimed to evaluate the performance and effectiveness of the SDM in relation to the nuclear density meter.

Our solution

The Rhosonics SDM can provide real-time readings on the densities of the slurry. The measurements are reliable, stable and environmentally friendly through the precision of the acoustic impedance of ultrasound waves

Data analysis was done after intervals of 9 hours, 12 hours, 24 hours, and 9 days. Upon day 9, the customer was content with the data received and the overall performance of the SDM comparing it to the results of the nuclear density meter. The point difference in the operating trends between both devices after the test run was 0.05%.



After 24 hours since the start of the calibration of the Rhosonics density meter, a lateral trend is observed in both variables, without significant differences in both trends.

Results

Having a clear understanding of the potential risks and regulatory challenges associated with the nuclear density meter, the user exhibited a strong inclination towards adopting a safer alternative that would maintain operational efficiency and accuracy without compromise. Their primary objective was to identify a solution that would incorporate essential safety measures while guaranteeing dependable and precise measurements. This approach aimed to effectively address concerns related to radiation hazards while simultaneously meeting the requirements for optimal performance in their operational processes.

After this successful trial with the Slurry Density Meter, Pan American Silver is planning to remove the nuclear density meters, due to the implications it has on the health and safety of personnel, and environmental, transportation and safety permits.

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