



A higher level of performance

Application Reference

Mining Concentrator Flotation Cells

Optimizing flotation cells in the mining industry

Application Problem:

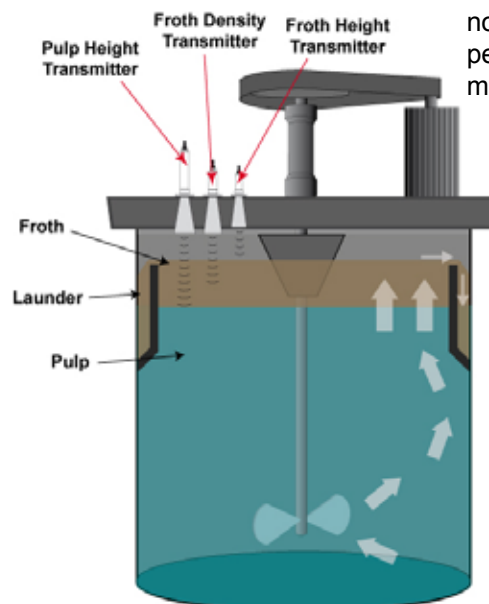
One of the most important process operations in a Mining Concentrator is the flotation cell area. Profitability of the Concentrator is largely attributable to this area of the process. Most older flotation cells use a displacement float below the froth layer to measure the pulp height. Pulp height is an extremely important process measurement, used to ensure that liquid pulp is not allowed to overflow to the launders. If pulp overflows, the flotation cell ceases to function effectively, which is very costly to the process. The displacement float technique is limited in performance in a variety of ways: the float may at times stick, slurry builds up on the float mechanism changing the effective specific gravity tracked, they are affected by high agitation, etc.

Solution:

1. Hawk has developed a very low frequency "Acoustic Wave Transmitter" that is non intrusive and will penetrate through the froth to measure the pulp height. The Hawk sensor is mounted above the froth and pulp height, so it has no maintenance or mechanical problems. Typically the transmitter can be mounted at walkway height for easy serviceability. The low frequency level transmitter can be supplied ready for connection to the typical 2 wire loop power supply used for the displacement float transmitter which it is replacing. Remote mounted transmitters are also an option.

2. Hawk also provides as an option, a non-intrusive transmitter to measure the froth height. Continuous measurement of the froth height, provided as feedback to the control loop for the inlet 'Dart Valve', allows a floatation cell to maintain constant overflowing of froth to the launder, even when the ore body type may produce variations to frothing consistency. Small changes in the pulp height to keep the froth overflowing at all times will increase the efficiency of the flotation cell and consequently increase profitability. Hawk transmitters will reliably measure froth height, even when froth density changes.

3. Hawk also provides a third type of transmitter to measure relative froth density. Higher density froth will have greater entrainment of mineral going over the launder. Currently, density measurement is not widely used due to the degree of difficulty in making an effective online density measurement in each flotation cell. Bubbler type pressure transmitters have been commonly used, though they have high maintenance costs due to their intrusive installation. A non intrusive transmitter that penetrates partly through the froth gives an output proportional to density. Data from the froth height transmitter is used with the froth penetration (density) information. Monitoring of the deviation between froth height and froth penetration allows the control system to track relative froth density - all non intrusively. Relative density data can be used to actively control density through a feedback loop, regulating forced air flow into the flotation cell. Air input is currently largely controlled manually by onsite operators.



Our Low Frequency non contact transmitter penetrates froth and measures

- pulp height
- froth density
- froth height

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