



APPLICATION NOTE Minerals & Mining

Remote level monitoring of a cooling water tank at a gold mine

- Improved buffer storage management of a coolant for the hydraulic drive of a SAG mill
- 80 GHz radar level measurement of foaming and condensing water containing anti-rust additives
- Remote monitoring of customer-specific level readings via HART® plus trend graph analysis
- Significant reduction of false alarming and technician call outs

1. Background

A global mining company operates one of the largest gold and copper mines in Australia. The site produces gold doré by running a gravity gold circuit involving different grinding and gravity concentration processes.

2. Measurement requirements

For grinding purposes, the operator runs a SAG (semi-autogenous grinding) mill. This is a cylindrical vessel containing steel grinding balls that reduce the size of the ore as the mill rotates. In this way, the mill provides a discharged ore feed that can be optimally processed in the following gravity and flotation processes.

The constant high-speed rotation requires the hydraulic drive of the SAG mill to be cooled properly. This is done by a cooling water system. To ensure that water supply is always guaranteed, the cooling system has a water balance tank made of fibre glass.



SAG mill

The cooling water stored in the tank needs continuous level monitoring. This was previously done by an ultrasonic level transmitter. Though the liquid level does not change very much, the tank is filled with an anti-rust additive that occasionally generates aerated foam. This leads to an extremely noisy signal that caused the ultrasonic level transmitter to drop out false alarms in the past. Given that the liquid heats up in operation, condensation also had a negative impact on the measuring performance of the competitor's device. Therefore, the mining company was searching for an alternative way to remotely monitor the water level in the tank.

3. KROHNE solution

KROHNE was offered to trial its mining specific measuring technology and recommended the combined use of the OPTIWAVE 7500 radar (FMCW) level transmitter with the SHD 200 control unit.

The OPTIWAVE 7500 was installed with DN70 PEEK Lens antenna with G3 process thread mounted to a DN200 low pressure flange. As the 80 GHz radar is flush-mounted, there is no intrusion into the tank. It has a very small dead zone and beam angle (4°), providing a strong and stable signal in the tank. The PEEK Lens antenna is insensitive to deposits or condensation and fits perfectly for the conditions in the water tank.



OPTIWAVE 7500 on ballast water tank

The Radar level transmitter was connected to the SHD 200 installed remotely for eye-level monitoring. This control unit exceeds the functionality of an ordinary display, though. It features different customer-specific measurement pages displaying different values for detailed process monitoring by communicating with the field device via HART®. An additional trend graph and summary page help monitoring the water level changes over time. Having been commissioned by a KROHNE engineer, the level measurement was instantly operational, providing reliable level readings, trending values and additional device status indication on the display of the SHD 200.



Remote level monitoring with the SHD 200



Different measurement pages for detailed process monitoring



Trend graph of level measurement over time

4. Customer benefits

The gold mine operator has been very satisfied with the remote level monitoring implemented by KROHNE. Unlike the ultrasonic level transmitter used previously, the OPTIWAVE 7500 provides stable measurement notwithstanding changing tank conditions like foam or vapour generation in the tank. This led to significantly less false alarming and less technician call outs, reducing time and effort of personnel. Cooling water for SAG mill operation is reliably stocked and monitored.

The client was particularly impressed by the trending page and functionality of the SHD 200. Replacing the 4-wire ultrasonic device with the 2-wire OPTIWAVE 7500 opened up the opportunity for the client to also utilize the backlight and NAMUR display functionality of the SHD 200. Thus, no additional wiring was even necessary for increased on-site monitoring convenience.

5. Products used

OPTIWAVE 7500 C

- Radar (FMCW) level transmitter for continuous, non-contact level measurement demanding liquids in corrosive environments
- 80 GHz radar, flush-mounted PEEK Lens antenna
- No tank intrusion, insensitive to deposits

SHD 200

- Control unit for 4...20 mA/HART® field devices
- Second 4...20 mA output for any HART® variable
- Status signalisation by 5 LEDs according to NAMUR NE 107



Contact

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