# APPLICATION NOTE

Minerals & Mining

## Level measurement of ROM ore in the ore pass of a gold mine

- Increased plant uptime due to reliable detection of rock blockages and monitoring of ore supply
- Non-contact radar level measurement of a 100 m / 328 ft deep opening for a smooth gravity flow of rock material
- Improved ore pass management allows safe and efficient rock handling process

### 1. Background

A major gold producer operates an underground gold mine in Australia. For rock handling purposes, the mine has a full ore pass system that allows material transfer by gravitation. The 100 m / 328 ft deep ore pass always keeps a certain level of run-of-mine (ROM) ore, which is collected and further transported to crushing and grinding plants. Rocks of different sizes are thrown into the ore pass by front-end loading trucks. For safety reasons, a screen grid (grizzly) is used at the dump point of the truck. This is to prevent the truck from falling into the 3 m / 9.8 ft wide opening while dumping the ore through the spacings in the grizzly.

### 2. Measurement requirements

The level of rock in the ore pass underneath the grizzly needs monitoring. Only if the level in the ore pass is kept above 30% can the equipment on the outlet side be protected. If the level drops lower, the equipment can be damaged when dumping rock into the empty ore pass. As the interruption of material flow is a major issue in underground mining, the ROM ore level also serves as a control parameter to detect blockages by oversized rock fragments.

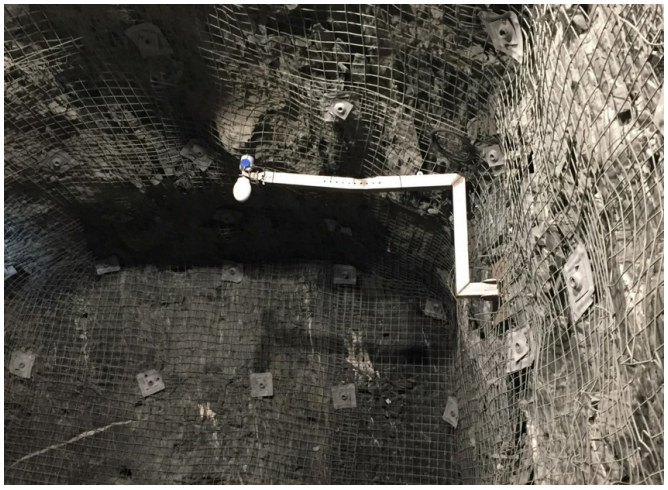
The client had so far monitored the ore pass level by carrying out manual dipping with a measuring device from a side tunnel. To automate the monitoring process and to better maintain plant uptime and process safety, the mine operator was searching for a reliable and rugged level transmitter suitable for continuous level measurement in underground mining operations.

KROHNE

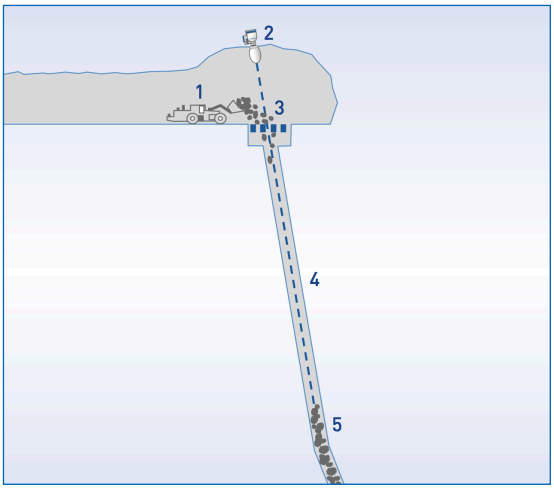
## 3. KROHNE solution

The mining company opted in favour of the OPTIWAVE 6400 C. Designed for continuous, non-contact level measurement of stones and ore fragments of different sizes, this 24 GHz FMCW radar level transmitter is well suited for applications with dusty atmospheres. It has a proven track record of operation in the harsh environment of mining.

The OPTIWAVE 6400 was mounted with a DN150 polypropylene (PP) Drop antenna around 6 m / 19.68 ft above the grizzly bars. This allows the radar signal to travel right through the spacings of the grizzly and hit the rock level in the ore pass. During commissioning an empty spectrum scan was done to cancel weak reflections from the grizzly and thus prevent any negative impact on the performance of the radar level transmitter. In this way, reliable and accurate level measurement is ensured.



OPTIWAVE 6400 installed above ore pass




Schematic of ore pass level measurement:
**1** Dump point; **2** OPTIWAVE 6400;
**3** Grizzly bars; **4** Ore pass; **5** Ore level

## 4. Customer benefits

As level monitoring in the ore pass is automated, the client no longer has to intervene manually. Measuring the ore level continuously and accurately with the OPTIWAVE 6400 helps the company react much quicker to events in the ore pass. Immediate steps to optimise the material flow can be taken. In this way, the mine operator benefits from improved ore pass management and a smooth and safe material handling. A shortage of supply of ROM ore can be prevented and process interruption of material flow is avoided way ahead of time. The level in the ore pass is kept above 30%, which minimises the risk for equipment damage. Likewise, blockages are reliably detected. When pulling ore out while the level stays constant, this is an indication for hang-ups of broken rock hindering material flow which is reliably identified by the KROHNE level transmitter. This translates into increased process safety, efficiency, and plant uptime.

## 5. Product used

### OPTIWAVE 6400 C

- Radar (FMCW) level transmitter for solids from granulates to rocks
- Continuous, non-contact level measurement of ore bins, crushers, stockpiles, conveyor belts etc.
- 24 GHz radar, Horn or Drop antennas
- Measuring range: 0...100 m / 328 ft

### Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
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Please visit our website for a current list of all KROHNE contacts and addresses.

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