Continuous crusher operation with better level measurement: Application of the month

Any mining operation is only as proficient as its crushing capabilities. The crusher is one of the first steps to processing the raw materials being excavated, taking large rocks and boulders and turning them into smaller, workable-sized material, and this is typically completed in two stages – a primary and then a secondary crusher.

Every crusher has an ideal level measurement at which it runs most efficiently. Too little material, and throughput drops significantly. Too much material, and the crusher becomes choked, damaged, or both, resulting in unplanned shutdowns and maintenance.

Getting an accurate and consistent level measurement in this application is a big challenge. Constantly falling materials can damage any level measurement instrumentation, and the constant cloud of dust and loud noises interfere with many level measurement technologies.

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A creative installation with 80 GHz radar

A large mining operation in Peru runs three crushers and three secondary crushers to process 18,000 tons of material every day. Operators never knew the level in their secondary crusher because dust interfered with non-contact measurement instrumentation, and there was a limited amount of space to mount a sensor. Operators were left guessing at how much material was entering the crusher, and the process consistently choked up, resulting in regular shutdowns.

VEGA representatives worked with staff at the mine to create a solution that would end the constant stoppages. They began with the VEGAPULS 69, an 80 GHz radar for the continuous level measurement of bulk solids. The sensor is equipped with special electronics to give it the ability to read through any clouds of dust and dirt. Plus, this radar sensor's high frequency gives it a narrow focus, which allows it to make measurements in tight spaces – something that came in handy during installation.

Mine technicians installed the sensor above the crusher and inside a small metal box to protect it from any falling material. Despite the tight fit, operators began receiving an accurate and reliable continuous level measurement. Shortly thereafter, mining staff installed VEGAPULS 69 radar sensors on the rest of their crushers.

mining industry rock crusher

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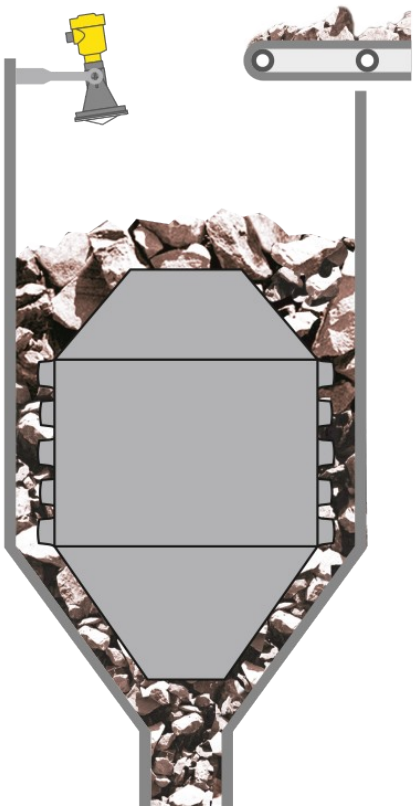
Running smoothly and safely

Since installing the new sensors, throughput has increased and unplanned shutdowns due to a crusher getting choked up and stopped have been nearly nonexistent. The mine’s safety record has also improved, since unjamming the crusher can be a dangerous job with a lot of opportunities for error. The secondary crushers had been holding back the entire mining operation before they installed the VEGAPULS 69s, and now incoming raw materials are being processed without interruption.

Related applications

Level measurement in the crusher

To be able to transport and further process the largest possible production volumes, the ore must have an optimal size. To achieve this, the ore is crushed to the correct size in two stages, in a primary and then a secondary crusher. In order to enable an optimum throughput, and avoid choking or damaging the crusher, a reliable level measurement is required.



Measuring task
Level measurement

Measuring point
Crusher

Measuring range up to
20 m

Medium
Ore

Process temperature
0 … +30 °C

Process pressure
0 … 0 bar

Special challenges
Dust generation, filling noise

Reliable

Reliable measurement even during filling

Cost effective

Optimal utilization of the container volume

User friendly

Simple mounting and setup

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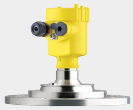

VEGAPULS 69

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