



Imerys Quarry bulk outload

A great example of modern ultrasonic level measurement in action is the ship loading station at Imerys Quarries at Fowey, Cornwall.

Imerys is the UK's largest producer of china clay and operates seventeen china clay pits around the UK, fourteen of which are in Cornwall. The vast majority of the china clay produced goes for export, primarily to the Nordic Countries, and 70% of the exported clay is exported via the deep water port of Fowey.

Clay emerges from the clay pit driers in a granular form with a high dust content. From the driers, trucks transport the clay into a 30 tonne hopper. This then feeds onto a conveyor and out onto the waiting ship. To minimize dust, the hopper is enclosed. The capacity of the truck feeding the hopper is close to the hopper capacity, so there is a need for a "traffic light" that tells the truck driver when the hopper is ready to accept the next load.

Pulsar Measurement supplied an Ultra 3 ultrasonic controller, coupled with a dB15 transducer. The Pulsar unit is non-contacting and uses a sound pulse to measure the level of clay. A relay closure is then provided when the level of clay is low enough to accept the next load.

The complicating factor, as can be seen from the images, is that the vehicle loads through a heavy grid. The level of the clay will sometimes be above the grid and other times below, so the ultrasonic unit must be capable of tracking the level through the grid without losing it. This will inevitably mean that the grid itself will provide the largest echo profile. Added to this is the high level of dust in the air.

In order to be successful, the DATEM software in the Pulsar system has to offer superb echo discrimination. Up until the last few years, this sort of application would have been unachievable using ultrasonic (or any other sort of) continuous level measurement.

The proprietary DATEM software analyzes the echo that returns from the whole target area, using advanced echo processing algorithms to identify the clay level from all competing echoes and then maintains contact with the correct echo, disregarding all other echoes, even when the clay level goes below the level of the metal grid.

More Information

Since writing this case study, the Ultra 3 has now been replaced by the Ultra 4.

Ultra 4: <https://pulsarmeasurement.com/ultra-4.html>



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