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Quarry company halts production stoppages with ABB drive

Hills Quarry Products has reduced pump failures and cut maintenance and energy costs using an ABB variable speed drive.

Up to 1,200 tonnes of aggregate per day can now be consistently extracted by avoiding pump failures following the conversion of a fixed speed motor to variable speed control.

Aggregate production at Hills Quarry Products' Cerney Wick site in Gloucestershire demands a high volume of water which returns to a sump for pumping to a settling bed. Float level switches in the sump activate a fixed speed pump. However, the fixed speed could be too high for demand, leading to the sump running dry and the pump failing. In addition, because the motor only runs at one speed, the stress on the pump set could lead to broken transmission belts, motor overcurrent or blocked pumps, leading to costly failures, typically every two weeks.

"The pump could be out of action for a few hours to a full day, depending on if it was a simple belt change or if the pump needed to be raised from the sump," says Olly Thompson, Quarry Manager. "We extract between 1,000 and 1,200 tonnes of aggregate every day at Cerney Wick, so any downtime is extremely costly – not just in terms of lost production, but also due to the extra expenses incurred by our maintenance team and external contractors."

Following a recommendation from ABB Value Provider, APDS, a 55 kilowatt (kW) variable speed drive (VSD) and level control device were installed to automatically adjust the pump motor's speed according to demand. A pressure transducer, installed in the sump, monitors water pressure. The VSD then calculates the water level that corresponds to this measured pressure, adjusting the pump speed to avoid overflows or the sump running dry.

"This system has reduced downtime, increased production and reduced the number of replacement drive belts as well as the cost of repairing the pump when it ran dry," says Thompson. "As well as avoiding failures and the associated costs, we have also cut electricity usage on the application by around 50 percent by matching motor speed to demand, achieving further savings."

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Caption: Hills Quarry Products was experiencing costly pump failures every two weeks at its sand and gravel quarry in Cerney Wick, Gloucestershire



Caption: Replacing a fixed speed pump motor with one that is variable speed controlled has reduced pump failures and cut maintenance and energy costs



Caption: Aggregate production demands a high volume of water which returns to a sump for pumping to a settling bed