

Industry: Cement manufacturing
Products: Frequency inverter drives

Green credentials complete for cement works

Two final variable speed drives are being fitted in a cement works in Derbyshire to complete its energy efficiency programme. All major axes within the plant are now speed-controlled, reducing total power consumption by 15 per cent or more.

Lafarge Cement UK's cement works in the Hope valley, the centre of the Peak District National Park, is fitting Mitsubishi 132kW drives to two fans used for cooling the clinker as it exits the kiln. Previously they were damper controlled, which is to say they ran constantly at top speed, with the air-flow controlled by partially closing the dampers or baffles. The Mitsubishi drives mean that the



motors can now have their speeds turned down to provide the exact air-flow required. Energy saving are expected to be significant because the air-flow is proportional to the cube root of the motors' energy consumption. For instance 50 per cent flow requires one-eighth or 12.5 per cent power.

"Another big advantage of the new set up is that we can improve the accuracy of the airflow control loop," says site engineer Mark Bramley. "The iris damper and actuator proved problematic. Now we can connect the inverters directly to a system controller to optimise the air-flow for maximising heat recovery in our clinker coolers."

Hope Works has always favoured Mitsubishi drives and uses them on the mill, the rotary kilns, pumps, fans, conveyors, feedwater, apron feeds and all other critical axes. Some of the 140 or more drives in use today are those originally installed up to 20 years ago – a testament to their reliability and robustness. "Reliability is absolutely critical to us," says Mark. "Stopping a cement plant to replace a part can affect our ability to supply our customers. Some of the drives are still the original Mitsubishi Z series units from the 1980s, which have an expected life of 3 years and are still serviceable today. "Maintenance intervention is limited to annual inspections, monthly filter cleaning and five-yearly replacement of cooling fans. A great advantage for us is that Mitsubishi always maintain backwards compatibility when they launch a new drive, so we can whip out an aging unit and drop in a new one with all the latest features and performance improvement with no great fuss."

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Mark Bramley
 site engineer of Lafarge cement works, Hope valley, UK

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Most of the Mitsubishi drives are controlled by Mitsubishi PLCs (programmable logic controllers), and some of these are the same vintage as the associated drives which reinforces our confidence in the reliability and longevity of the Mitsubishi products. As a result of the plant's location, due to the availability of the raw materials necessary to make cement Mark's team faces a challenging, being at the end of a lengthy electrical distribution network. When starting up large DOL synchronous machines the plant can suffer from a significant voltage depression. Previously this could be a problem, which was one of the main reasons for installing the first big drives, Inverters up to 375kW on the cooler and the kilns. By using the drives any spurious over- and under-voltages to the motors can be smoothed out, to get a more uniform running and reduce maintenance of the motors and running gear.

First published in August 2009 by Mitsubishi Electric, based on information provided by Lafarge Cement UK's cement works, Hope valley.