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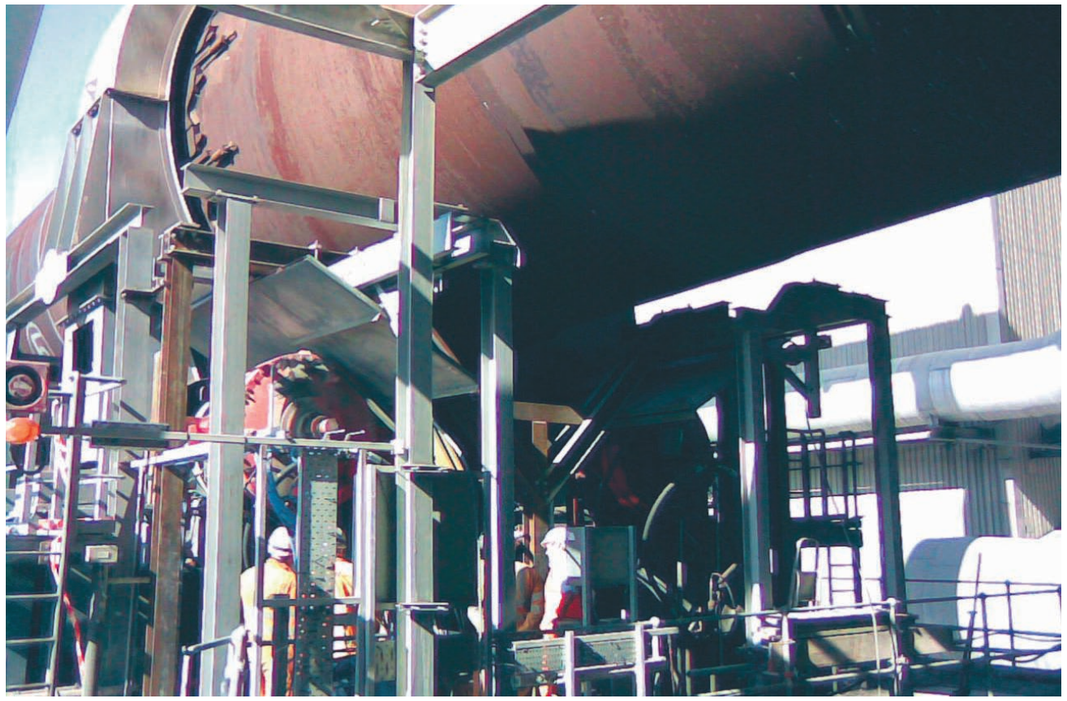
Brian Holmes,
Hägglunds Project Manager

Capacity for 72,000 houses

» NEW KILN DRIVE HYDRAULIC SYSTEM FOR CEMEX'S RUGBY CEMENT PLANT.



The new system was installed in February 2008 during the annual plant shut down and was successfully carried out on time.

Hägglunds Drives UK, have supplied and commissioned a new kiln drive hydraulic system at CEMEX's Rugby works. The plant has a production capacity of 1.8 million tonnes of cement per annum with a single kiln line.

THE ORIGINAL KILN SYSTEM was rather complex in design and potentially becoming unreliable with difficulty in servicing the pumps and obtaining spare parts within a reasonable lead time and this was an important issue as regards maintaining plant reliability and insurance.

A new system using larger Hägglunds SP750 pumps was the answer. This solution eliminated the need for tandem pumps and separate boost pumps thereby simplifying the system. A further improvement by adding a third SP750 pump meant a standby pump was available to provide extra security.

The kiln, manufactured by Krupp Polisius is 62 meters long and 4.64 meters in diameter.

Possibilities for independent control

The kiln, manufactured by Krupp Polisius is 62 meters long and 4.64 meters in diameter and has a vertical static download weight of 700 tonnes through the centre line of the drive tyre by design when fully loaded. It is driven by two friction rollers 2m in diameter and each roller is driven by two Hägglunds hydraulic motors type Marathon MB800. The kiln rotates slowly at around 3.5 rpm and must not stop as it is a critical piece of the plant. All production goes through this one kiln at the plant and an unplanned stoppage with the tremendous heat generated in the kiln would distort the kiln shell and create further potential disruption. Therefore a barring drive is also installed to enable a low power, slower rotation of the kiln in the event of a major failure on the main drive system or it's power supply, untill the main drive is fixed or until the kiln has cooled sufficiently to be stopped. The drive motors are fed in parrallel from a common power unit and the drive load is shared equally between the four drive motors, naturally, since the hydraulic pressure must be equal at all points in the system. Therefore the two friction rollers share the kiln driving load equally. Although if one roller should start to slip, this would be sensed electronically and there is a back up system to control the speed of each roller independently, in this unusual circumstance.

Environmental benefits

The kiln is fed with Slurry and Raw Meal in a semi-wet process. The Slurry being piped to the plant from the quarry operation, some 57 miles away. The traditional fuel used is coal but the use of chipped tyres has reduced coal fuel intake and reduced emmissions, dependance on fossil fuels and improved environmental benefits. A new fuel called Climafuel which looks a bit like shredded paper or fluff and derived from household and commercial waste after the recyclables have been removed is also being trialled. This reduces dependance on fossil fuels even further and has obvious environmental benefits.

The original barring drive was integrated into the main power unit but now a separate power unit with it's own fluid reservoir, cooling system and power supply has been installed outside the main power unit pier for this purpose and therefore provides a more secure barring facility. The barring drive can also now drive the kiln in reverse – a very useful new feature for use during kiln maintenence operations.

Isolation valves have also been installed at the four drive motors to enable the kiln to drive with one motor taken out in emergency situations.

Successful installation

The new system was installed in February 2008 during the annual plant shut down and was successfully carried out on time to the satisfaction of Cemex and has been running trouble free since then. Naturally full documentation has been supplied and training sessions have been completed to bring plant personel up to speed on the new system.

The installation had to tie in with the already planned Kiln shutdown, therefore the seperate barring drive was installed and tested off line, with the final pipework connections installed during the kiln cool down period. The main drive station was removed and the new unit installed in the drive pier in a tight timeline.

Brian Holmes, Hägglunds Project manager for this job added, "This was a large and interesting project and we enjoyed the challenge, particularly with the friendly, expert support from all the Cemex people we worked with. Although it was such a large system it is notable that the solution was basically a standard Hagglunds power unit with a little customisation here and there, particularly on the pipework and valving. I think this demonstrates just how wide the standard Hagglunds systems are. I would also like to thank GS Hydro who helped us with the piping." ■