

## “Somewhere over the Rainbow ...”



“..... Skies are Blue”, so goes the Judy Garland song from the film, “The Wizard of Oz”.

A little more seriously, Hanson Cement is hoping that the recent replacement of two Electrostatic (ESP) filters at its Ketton Works will improve the recovery of dust particles, as well as reducing particulate emissions.

All cement plants in the UK must comply with safe emission limits to air, land and water with reference to Best Available Technology. Various technologies are available to undertake this application including Electrostatic Precipitators (ESP's) and Fabric Filters. ESP filters are suitable for handling gas streams in excess of 260°C; but on cement plants, fabric filters have become the leading technology due to improvements in filter cloths. Whereas ESP's use charged plates to attract dust particles, fabric filters work on the basis that dust accumulates on the outside surface of a filter bag. To avoid the fabric cloth becoming blocked a reverse high velocity pulse of compressed air is blown into the filter bag rapidly changing the shape of the bag wall. This knocks the dust off the outside wall and lets it fall into the hopper below. Both these technologies are generally capable of meeting emissions limits for dust if correctly implemented and maintained.

Hanson Cement at Ketton approached Fairport Engineering in early 2016 to discuss a plan for the replacement of their ESP's on Mills 9 & 10. Hanson identified their preferred bag filter manufacturers but wanted an organisation to act as a main contractor, taking overall responsibility for the project, including control of the site under the CDM 2015 regulations and to manage the design, supply and installation of the balance of plant. After reviewing the construction phase options with Hanson, Fairport developed a proposal that would minimise disruption to cement production, but meant that work would have to be undertaken within two, pre-planned, 3 week shut down periods, one for each filter.

Mill 9 was the first unit to be replaced and once pre-works and site establishment had been completed Fairport took control of the site under CDM 2015 regulations. Installation teams worked in back to

back shifts on a 24 hour, 7 day basis to disconnect and remove Mill 9 ESP. Support structures, the existing fan and ducting were also removed to prepare the location for the installation of a new bag filter. The new system also required the installation of new screw conveyors, rotary airlocks and the reconfiguration of existing control panels, plus the installation of new 160KW central exhaust fans and associated clean gas ducting.

All works were completed within the agreed shut down period for Mill 9. A short break then followed prior to the Mill 10 shut down, this enabled pre-assembly works to begin. Upon commencement of the Mill 10 shutdown Fairport began to remove the second ESP, its supporting equipment and associated processes. Installation of this second bag filter, with its attendant equipment and processes to recover the captured dust, could then begin and was, again, successfully completed and handed over within the agreed period.

The construction phases of this project could only begin after detailed planning and the preparation and agreement of risk assessments and method statements (RAMS) to ensure all equipment could be safely removed and replaced. Working at height with the use of cranes with fly jibs (as can be seen in the photograph) led to an extra level of complexity. Maintaining a safe working environment on an operational site is a specialist skill that Fairport has developed over many years. As a result Fairport delivered the construction phase on time and to budget with all works completed safely with no lost time incidents after the expenditure of over 15,000 construction hours; and just to add a little icing on the cake it is reported that to date the daily averages on both filters are well below the target emission level.

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