GREENBANK
Enhancing Performance

CASE STUDY

Optimizing Multi-Outlet Mills using PfMaster CFMS

Optimizing coal distribution for multi-outlet mills

For a boiler with an aggressive over fire air strategy or Boosted Over-Fire-Air, a couple of burners out of each boiler row with the richer percentage of coal would be the main contributor to carbon levels when staging air to the upper furnace area.

Distribution is the major influence on combustion efficiency and un-burnt carbon. Fineness does improve carbon, but is a second order effect to the actual coal to air ratio at each individual burner.

A 330 MW plant in Southern Europe, Foster Wheeler Boiler, Front Wall Fired:

A 330 MW front wall fired plant with MBF 22.5 mills and 4 outlets from each mill. Mills fitted with FLS high performance classifiers, and each pipe had 4 off adjustable paddles fitted inside the classifier for each burner pipe. This was to allow coal to be diverted away from any particularly high coal flow burner pipe shown below.

PfMaster sensors supplied by Greenbank were used together with the adjustable blades to optimise the coal distribution to the multiple outlets.
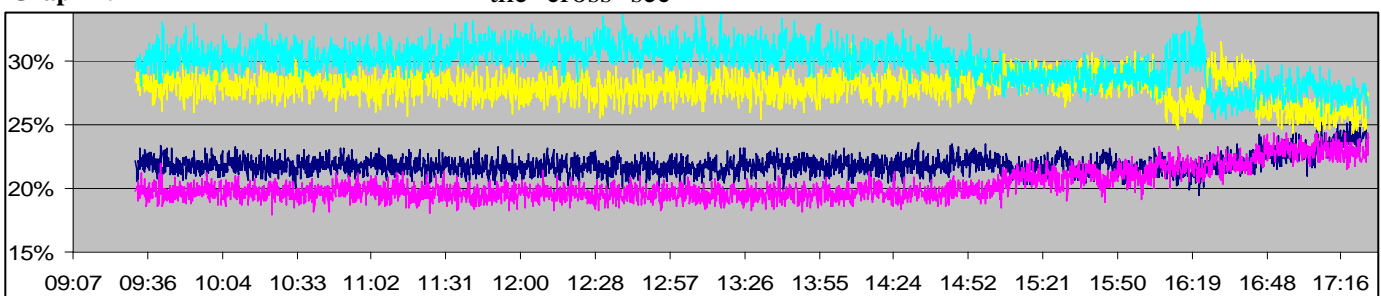
Graph 1 below shows one of the graphs of adjusting the coal distribution using the paddles of a particular mill, the extent of the improvement being limited to the design and relative size of the paddles to the cross sec-
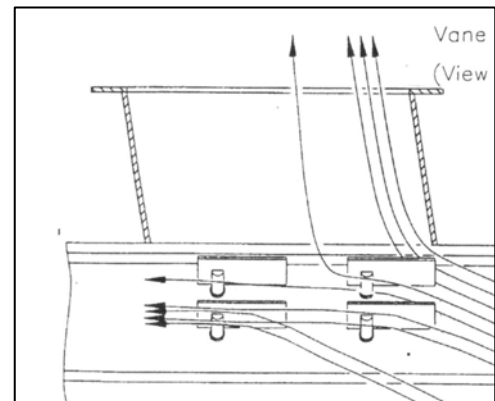
Diverter Blades in Classifier Outlet Pipes:
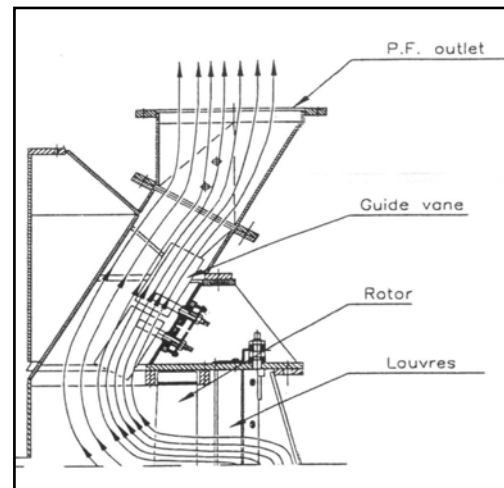
Graph 1:

Balancing Multi-Outlet Mills

Graph 2 below shows a second mill where the aim was also to reduce the pulsing flow effect which could also be physically felt at the burner valves.
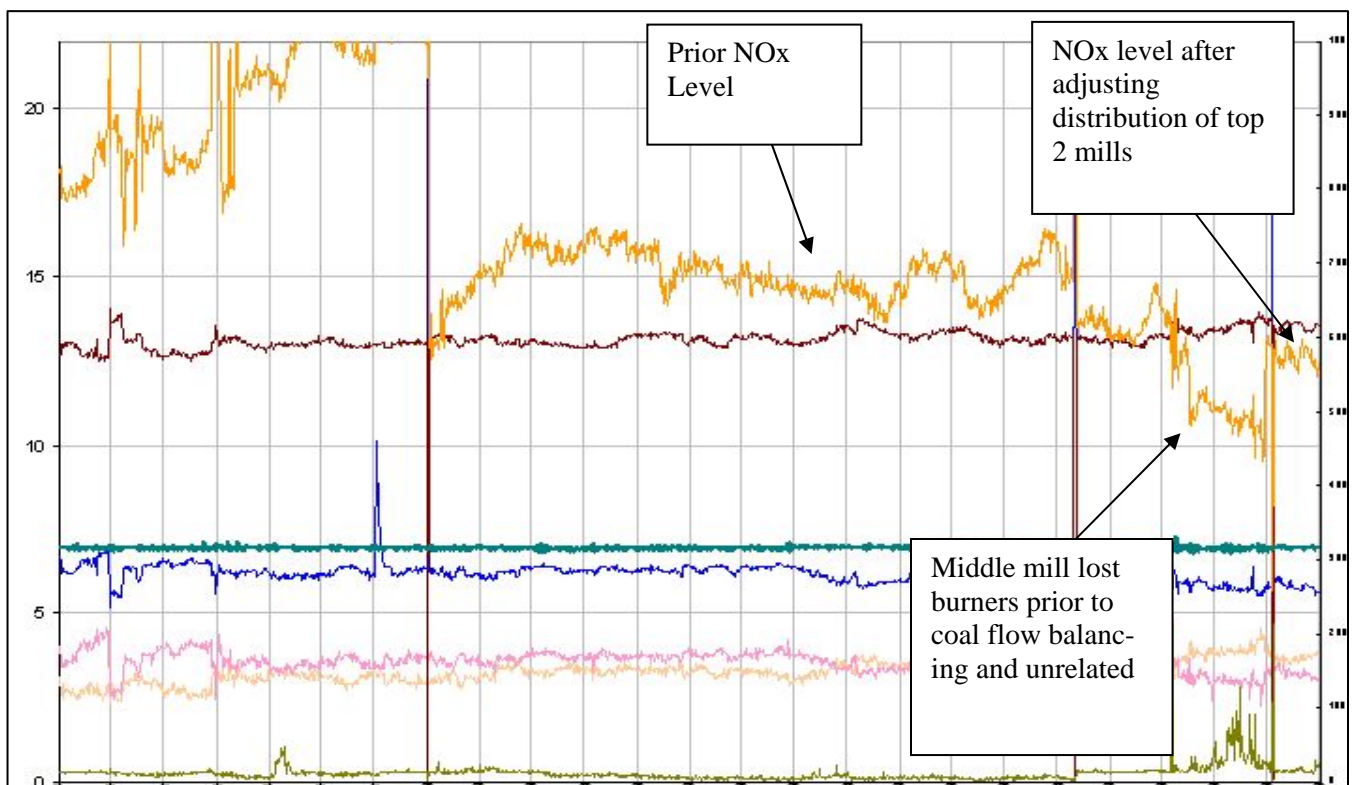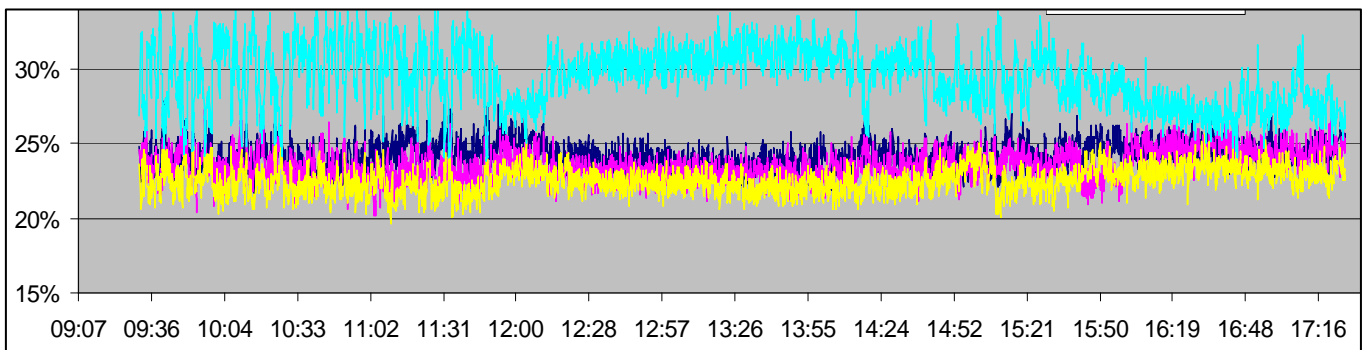
The PfMaster technology was used to measure the coal distribution and velocities in particular burner pipes in order to adjust the various paddles on any mill.

Adjusting the coal distribution in the top 2 mills resulted in lowering the NOx trend given below as the light brown trend line.

PfMaster Installed In Vertical PF Lines:

Graph 2:

Prior NOx Level

NOx level after adjusting distribution of top 2 mills

Middle mill lost burners prior to coal flow balancing and unrelated

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