

CASE STUDY

VARB - Lowering Levels of Carbon-in-Ash

A UK boiler of Foster Wheeler front wall boiler comprising 48 burners, with each mill serving 6 burners. Each Babcock 10E mill has 2 outlets which splits into 3 burner pipes close to the burners.

Greenbank's contract was to modify existing pipe work to improve the coal distribution to the burners, allowing each burner to receive similar coal flow.

The boiler design has a common wind-box so making attempts to match secondary air flow to individual burners a significantly less attractive solution, and allowing similar individual burner flame characteristics would give greatest impact on heat distribution across the front wall boiler.

The goal was to allow the boiler control system to generate under the same NO_x level goals but to reduce the un-burnt carbon levels in the ash.

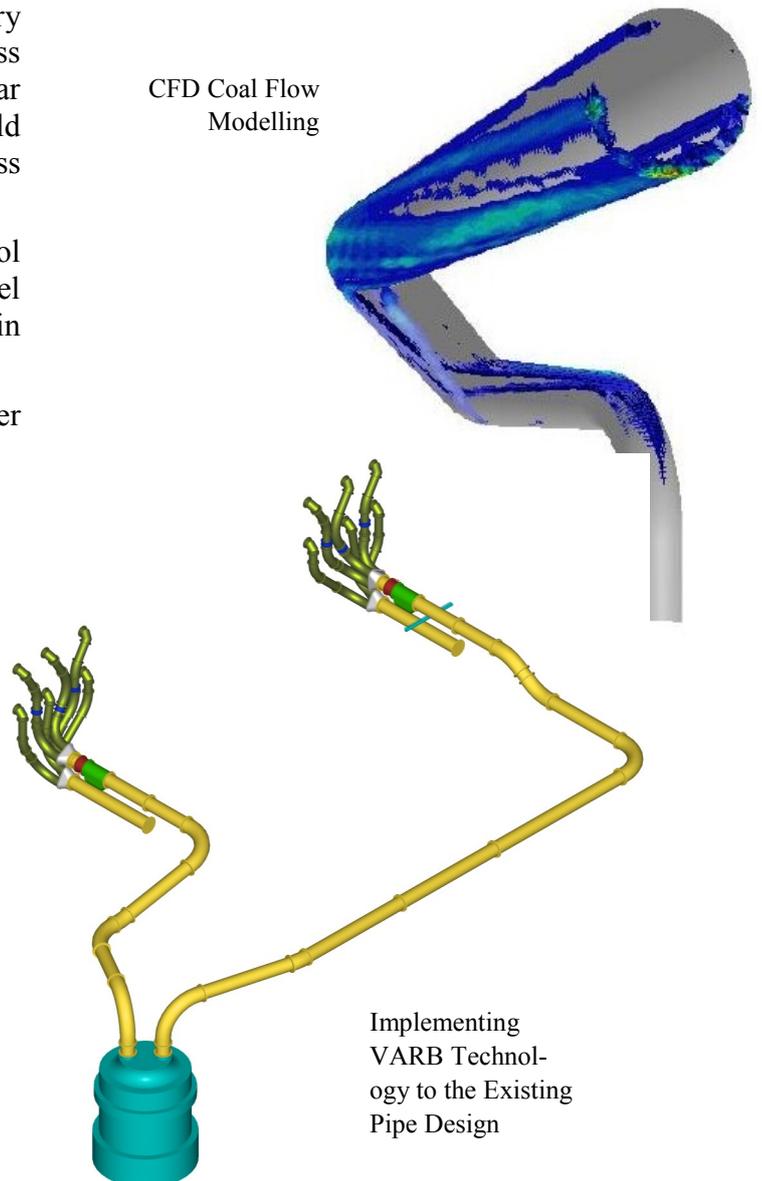
Alternatively, given improved burner stoichiometry, the station had the option to leave carbon in ash unchanged and reduce further the NO_x levels generated using boiler O₂ level control.

The solution process firstly involved CFD modelling of all coal flows for every mill to each burner for the particular boiler, and Greenbank studying historical coal distribution data, together with information on localised wear rates of coal pipe work, heat imbalances in the furnace, and other information pertinent to how the coal historically travels from mill to burners.

Greenbank subsequently and successfully, implemented the H-VARB technology to improve the distribution of coal to the burners.



CFD Coal Flow Modelling



Implementing VARB Technology to the Existing Pipe Design

