

**hrl:**

# Combustion tuning with overfire air



**expertise in action**



# HRL improves black coal fired boiler efficiency resulting in significant cost savings for Australian generator

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## Challenge

An Australian Generator needed assistance with the combustion tuning of one of their black coal fired boilers. The client reported that the boiler had been experiencing operational issues including high concentrations of carbon monoxide and carbon-in-ash, significant splits in the excess oxygen concentrations, economiser erosion, and under performing heat rate.

## Solution

HRL worked closely with the client to develop a targeted and cost-effective combustion tuning program; with the primary objective to optimise the unit heat rate. HRL utilised both the mic One online PF distribution and Multipoint Combustion Diagnostic Analysis (MCDA) systems to measure both the relative PF distribution and the resultant combustion gas profile. The combustion tuning program also included the optimisation of the overfire air system; an Australian first for HRL.

## Results

As a result of the improvements to and optimisation of the combustion and OFA systems, this Australian generator has experienced the following benefits:

- A measurable boiler efficiency improvement, equating to permanent annual fuel savings;
- Reduction of the excess oxygen setpoint;
- A reduction of the secondary air flow rate and reduction of associated FD fan power draw;
- A significant reduction of the flue gas velocity through the economiser; and
- Reduction of spatial temperature differentials for the secondary superheater and secondary reheater, reducing the risk of overheating.

HRL estimates that, in general, the total cost savings of combustion tuning could easily exceed \$1 million/annum. HRL is working with this client to assess the potential for the combustion tuning of the remaining units, and additional combustion and operational improvements to improve the unit heat rate.

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