NOx Control Issues for a Power Generator

Coal Research Forum

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Agenda

- Introduction
- Overview of Ferrybridge C Power Station
- Historical Plant Modifications for NOx control
- Consequences of NOx control equipment
- Engineering Developments
- Future Plant Modifications for NOx control
- Other Challenges



Overview of Ferrybridge C Power Station

- Situated on the River Aire, in West Yorkshire.
- It is the third coal-fired power station to be built on the site since 1924.
- Ferrybridge C first fed electricity into the national grid in February of 1966.
- It consists of 4 x 500MW pulverised fuel units
- Each consuming 200Te/hr
- Storage capacity of approx 1 million tonnes







Historical Plant Modifications for NOx Control







Consequences of NOx Control Equipment

- Poor combustion (high CIA) due to the Low Nox Burner design and installation of BOFA
- Burners are oversized which is reflected in the low windbox pressures therefore fans not on auto.
- The PF/PA velocity is greater than the secondary air velocity. Long unattached flames impinging on rear wall.
- Even if more air is supplied to burners (i.e. taken off BOFA) combustion does not improve (high CIA and CO) and NOx increases.
- 5 % fuel is being combusted in the convective sections of the unit
- Combustion is not being held within furnace















Engineering Developments



Figure 21 - Full Furnace Models - 10,000 ppm CO Mole Fraction Iso-Surfaces













Future Options for NOx Control at Ferrybridge



Other Challenges

- » Fuel Distribution
- » Air Distribution
- » Mill Performance
- » Airheater performance
- » ID fan capacity
- » Fuel Characteristics
- » Feed heating issues
- » Frequency Response
- » Tube Leaks

