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Ingenuity for life

Cottam, EDF, England

34% Reduction of NO_x emissions

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Efficient
combustion
control
reduces NO_x
emissions by

34%
at Cottam
Power Station

The Plant

The coal-fired Cottam power plant in Nottinghamshire, middle England, was built in 1969 and has been operated by London Energy (EDF Energy) since 1990. With a capacity of four 500 MW hard-coal-fired units, it supplies up to 4% of the UK's electric power need.

The Task

As the UK government had significantly decreased the permissible emission values, output of NO_x at Cottam had to be reduced by at least 20%. Such a step usually involves high investment in plant equipment. EDF was committed to finding the most cost-effective way to meet the new requirement. The challenge was to reduce NO_x emissions in Cottam while simultaneously increasing plant efficiency and leveraging cost savings to improve their market position in a highly competitive environment.

The Solution

To meet the new requirements while avoiding extensive mechanical modifications of the plant equipment, EDF decided for optimization of the combustion process with the help of NO_x Reduction performance optimization solution, part of the Siemens Omnivise Digital Services portfolio.

The measurement system uses a series of laser beams which detect the distribution of temperature and the concentrations of CO, O₂ and H₂O directly above the combustion zone in the furnace. The results are used for a two-dimensional distribution calculation which forms the basis for the optimization itself. Closed-loop set point corrections are calculated for existing combustion controls.

These corrections manage, among other things, the individual balancing of the air and fuel mixture for small groups of burners and where applicable – of over-fire air. In this way, the combustion process of the hard-coal-fired power station can run with higher efficiency, lower coal consumption and, of particular importance, with significantly reduced primary NO_x emissions.



Indeed, the 34% reduction in NO_x exceeds the contractually guaranteed target performance value. The range of benefits offered by Siemens NO_x Reduction performance optimization solutions, coupled with Siemens' fast and competent project execution, simultaneously helped the operator to fulfill their commitment to meeting environmental requirements, improve efficiency and reduce costs.

The Result

- **Reduced NO_x emissions and increased efficiency:** Optimization of the combustion process helped the operator to exceed governmental requirements and improve efficiency of the plant
- **Reduced operating costs:** Lowered coal consumption and a more efficient burn cut operating costs

“The fact that the trial led us to place further orders for two units tells its own story. In truth, we hadn't expected to achieve quite the level of performance we're getting.”

Wolfgang Hahn, Head of Design Authority, EDF Energy

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