

# TECHNO-ECONOMIC EVALUATION OF CLEANER COAL FIRED PLANT OPERABILITY

## OBJECTIVES

A three year research programme is being undertaken to develop ways of calculating the benefit of plant flexibility as a function of operating regime. This information will be used to evaluate methods for improving plant designs to ensure the optimum trade off between flexibility and other crucial plant parameters such as capital cost, efficiency and reliability. The main aims of the programme are:

- to develop methods for assessing the costs associated with the operational inflexibility of cleaner coal power stations
- to develop methods of determining the most cost-effective trade-off between plant flexibility and other plant characteristics such as efficiency
- to develop ways of improving the design of cleaner coal power stations

## SUMMARY

Electricity markets throughout the world are being reformed and deregulated. One result of this is that power stations are required to operate more flexibly, with more starts and stops and more rapid variations in output. As a result there is considerable commercial pressure being put on manufacturers to provide plant that can be operated flexibly, and on generating companies to buy such plant. However, improving the operational flexibility of a plant almost invariably involves some additional expense, either in terms of increased capital costs or a reduction in efficiency or reliability.

This issue is particularly acute for the new generation of cleaner coal-fired power stations that are now coming on to the market and, in particular, for integrated gasification combined cycle (IGCC) plants, which offer efficient generation of power from coal with excellent environmental performance. However, the operational flexibility of IGCC is believed to be poor and this is one factor inhibiting its uptake. There is thus the need to be able to quantify the costs/benefits associated with plant inflexibility/flexibility in order to design and build new, cleaner coal plants with optimum lifetime economic performance.

Powergen UK plc and the University of Manchester Institute of Science and Technology (UMIST) are working together to explore ways in which the costs of plant inflexibility can be quantified. Powergen is contributing its expertise and experience of operating in a variety of liberalised power markets world-wide, whilst UMIST is one of the world's leading centres for the economic optimisation of complex industrial processes.

## COST

The total cost of the project is £105 000 of which the DTI is contributing £50 000

## DURATION

Three years commencing January 2000

## CONTRACTOR

Powergen UK plc  
Power Technology Centre  
Ratcliffe on Soar  
Nottingham  
NG11 0EE

In collaboration with UMIST's Department of Process Integration



Large (2000 MWe) coal-fired station

**Further information on the Cleaner Coal Technology Programme, and copies of publications, can be obtained from:**

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