

VIRTUAL PLANT DEMONSTRATION PROJECT

OBJECTIVES

Foresight's Advanced Power Generation Task Force has recommended that an initiative should be undertaken to produce a Virtual Plant Demonstration Model. The 'Stepping Stones to Sustainability' report of the Foresight's Energy and Natural Environment Panel recommends a priority area for R and D on 'low and close-to-zero emission power generation'; a realistic VPDM will be a key tool in ensuring the UK can successfully develop fossil fuelled commercial plant that delivers this.

The VPDM should reduce the need for full-scale demonstrations of advanced power station technologies, which for large plant typically cost £100's million and should also reduce commissioning times for new plant. It will also help in the development of new technologies and assist in avoiding 'dead-end' developments. Finally, it will be of benefit to existing plant by being able to model new technology upgrades, which could be a major business in some markets where existing coal plant could become marginalised.

Specific objectives are:

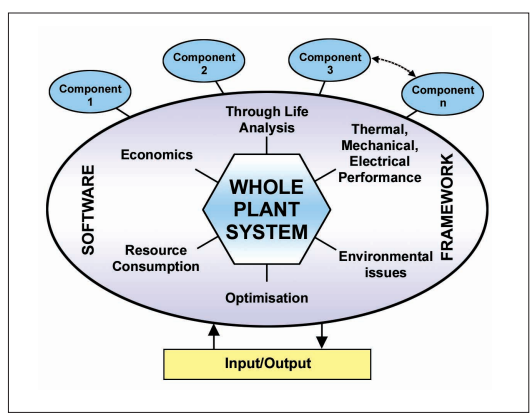
- identify the benefits and future requirements for a Virtual Plant Demonstration Model (VPDM) for pf and GT/IGCC plant, taking note of potential long term power plant developments
- review UK capability in power plant modelling needed to meet requirements, through discussions with both participants and UK power industry contacts
- review the worldwide capability in power plant modelling through literature searches, industry contacts, public domain sources
- identify where existing plant models can be applied with benefit to current needs
- identify developments needed to produce a CPDM for present and future clean coal technologies
- organise a UK workshop to discuss and provide guidance on: needs and benefits of a VPDM; current modelling capability; optimum way forward. Invitations to attend will be sent to interested parties in industry, academia and government
- produce a Technology Status Report summarising the work of this project and the output from the workshop. This report will include a recommended strategy for producing a successful VPDM

SUMMARY

The UK has a track record of power plant development and operation that is second to none. However the UK has at times fallen down on getting these developments into the market place; the ABGC and some IGCC designs are examples of this. In the case of GTs, new developments have been pushed through into the market place but often they have been accompanied by major commissioning, operation and maintenance problems that have threatened their economic viability. A way round these problems is to have major demonstration programmes but these are extremely costly for large plant and difficult to fund.

Another major stumbling block for new plant, particularly coal plant, is getting authorisation and public acceptance to build it – whatever the technology. This is true for large demonstration plant, for commercial plant and for major upgrades to existing coal plant.

The Advanced Power Generation Task Force of the Foresight programme has recognised these difficulties and has proposed the development of a Virtual Plant Demonstration Model (VPDM) as a way of helping to ensure that new technologies are successful in getting into the market place in the future. It is envisaged that a future VPDM will provide an integrated software environment which will allow the full potential for whole-plant software modelling to be realised, such that UK industry can provide competitive power plant solutions with significantly reduced development costs, with significantly reduced risk and with a cost-competitive final product. This would be applicable to new plant technologies both for existing plant and future plant.



VPDM Integrated Software Framework

COST

The total cost of the project is £49 200 with a contribution of £22 990 from the DTI

DURATION

6 months – January 2002 to June 2002

CONTRACTOR

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