

Identification of Key Parameters for Benchmarking of Combined Cycle Power Plants Retrofit

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Abstract : Benchmarking of a process with respect to energy consumption, without accomplishing a full retrofit study, can save both engineering time and money. In order to achieve this goal, the first step is to develop a conceptual-mathematical model that can easily be applied to a group of similar processes. In this research, we have aimed to identify a set of key parameters for the model which is supposed to be used for benchmarking of combined cycle power plants. For this purpose, three similar combined cycle power plants were studied. The results showed that ambient temperature, pressure and relative humidity, number of HRSG evaporator pressure levels and relative power in part load operation are the main key parameters. Also, the relationships between these parameters and produced power (by gas/ steam turbine), gas turbine and plant efficiency, temperature and mass flow rate of the stack flue gas were investigated.

Keywords : combined cycle power plant, energy benchmarking, modelling, retrofit

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