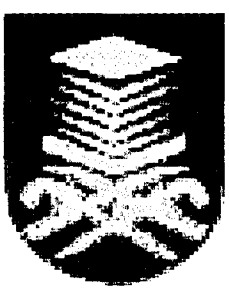
SIMULATED ANNEALING FOR SOLVING

ECONOMIC DISPATCH PROBLEM

Thesis is presented in partial fulfillment for the award of the

Bachelor of Electrical Engineering (Hons)

UNIVERSITI TEKNOLOGI MARA



WAN KHAIRULIZUAN BIN WAN ISMAIL

FACULTY OF ELECTRICAL ENGINEERING

UNIVERSITI TEKNOLOGI MARA

40450 SHAH ALAM, SELANGOR

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ABSTRACT

This project presents the Simulated Annealing (SA) solutions to the Economic Dispatch (ED) problem in power system. ED is very critical and essential part in electrical power system since it gives impact to the total generation cost of the system. The ED problem is to minimize the total cost of generation under various systems and operational constrains while satisfying the power demand. An optimization technique will be required to find the optimal combinational power generator output of the system, in order to achieve ED objectives. SA does not have many mathematical requirements for optimization problems. They can handle any kind of objective function and any kind of constraint (linear or nonlinear) defined on discrete, continuous or mixed search spaces. In the SA algorithm, the load balance constraint and the operating limit constraints of the generators are fully accounted for. In the development of the algorithm, transmission losses are first discounted and they are subsequently incorporated in the algorithm through the use of the B-matrix loss formula. The algorithm is demonstrated by its application to a test system. To evaluate the proposed method, a six unit generating power system was tested in order to obtain the minimum cost of generator. SA algorithm used in this study was implemented by using MATLAB 7.8.0 (R2009a). The experimental results show that the SA method has the capability for obtaining higher-quality solutions in solving the ED problem while at the same time have good performance in terms of to minimize total generation cost and have shorter time taken in optimization process.

Keywords: Economic Dispatch (ED), Simulated Annealing (SA)

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