ANT COLONY OPTIMIZATION FOR SOLVING ECONOMIC DISPATCH OF POWER SYSTEM

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UNIVERSITI TEKNOLOGI MARA

MUHAMMAD SHUKRI BIN CHE HASHIM

FACULTY OF ELECTRICAL ENGINEERING

40450 SHAH ALAM, SELANGOR DARUL EHSAN

FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA

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ABSTRACT

Economic dispatch is the method of determining the most efficient, low-cost and reliable operation of a power system by dispatching the available electricity generation resources to supply the load on the system. The primary objective of economic dispatch is to minimize the total cost of generation while honoring the operational constraints of the available generation resources.

Economic load dispatch problem is allocating loads to plants for minimum cost while meeting the constraints. It is formulated as an optimization problem of minimizing the total fuel cost of all committed plant while meeting the demand and losses .The variants of the problems are numerous which model the objective and the constraints in different ways. The basic economic dispatch problem can described mathematically as minimization of the total fuel cost of all committed plants subject to the constraints.

In order to achieve the economic dispatch (ED) objective, an optimization technique will be required to find the optimal combinational power generator output of the system. In this study, an optimization technique called Ant Colony Optimization (ACO) had been applied in solving ED problem. An economic dispatch problem, consisting of six generating units is applied to compare the performance of the proposed method with those of genetic algorithm (GA) and simulated annealing (SA). ACO algorithm used in this study was implemented by using MATLAB 7.6.0 (R2008a). The experimental results show that the fuel cost obtained by the ACO is slightly lower than those of the GA and SA methods.

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