ECONOMIC LOAD DISPATCH
USING SELECTION BASED
PARTICLE SWARM OPTIMIZATION

DISSERTATION

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CERTIFICATE

I, RAJAT MEGHVANSHI, Roll No. 2K13/PSY/13 student of M. Tech. (Power System), hereby declare that the dissertation titled " ECONOMIC LOAD DISPATCH USING SELECTION BASED PARTICLE SWARM OPTIMIZATION" under the supervision of Dr. Uma Nangia and Dr. N.K. Jain of Electrical Engineering Department, Delhi Technological University in partial fulfillment of the requirement for the award of the degree of Master of Technology has not been submitted elsewhere for the award of any Degree.

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ABSTRACT

The Economic power dispatch problem is one of the most important problems to be solved in the operations of power system. It is basically a non-linear optimization problem having linear and non-linear equality and inequality constraints. This is a real time problem for properly allocating the real power output among the committed generators such that fuel cost is minimized while the demand requirement is met and the constraints imposed are satisfied.

The main objective of this thesis is to study the performance of Selection Based Particle Swarm Optimization (SBPSO) technique to solve economic load dispatch problems. SBPSO performance is compared with the Basic Particle Swarm Optimization (BPSO). In this thesis, selection procedure of size of particles in BPSO is changed to new selection criteria. This selection is based on the function value of the particles. The size of particles is decreased in each iteration by some decrement factor. In the 1st iteration the size of particle is same as initial size and in subsequent iteration the size of particles decreases by some decrement factor for the remaining evolution. This decrement of particles in each iteration is being done in a way that particle for which the value of function is less will be selected and the particles with higher function values will get discarded. In this thesis, the particle size goes on decreasing in each iteration which will become very less than the minimum number of particles required to optimize a function. Therefore, the minimum number of particles required to optimize a function has been fixed and for subsequent iteration the size of particles will be the minimum value for the optimization.

A MATLAB program has been developed for SELECTION BASED PARTICLE SWARM OPTIMIZATION to Economic Load Dispatch problem. Program is tested on IEEE 5, 14 and 30 bus system and the results are compared with Basic PSO technique.

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

PSO	Particle Swarm Optimization
SBPSO	Selection Based Particle Swarm Optimization
ELD	Economic Load Dispatch
GA	Genetic Algorithm
BPSO	Basic Particle Swarm Optimization

CONTENTS