

HYDROTHERMAL SCHEDULING USING HYBRID ALGORITHM



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Dedication

Dedicated to my mother, wife and children.

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Abstract

The basic purpose of hydrothermal scheduling is to reduce the cost of thermal plants. To achieve this goal one has to meet certain constraints of hydro and thermal plants. In this regard one has to satisfy different constraints of the hydraulic and thermal power systems. In Short term hydro thermal scheduling load demand follows a periodic variation for one day or a week therefore interval for this range small. For such a short interval the head may be taken constant. The amount of water required for the short range problem is determined by the long range problem [1].

If all the constraints are considered then the short term hydrothermal scheduling (STHS) problems becomes complex and nonlinear. The problem has been resolved by numerous traditional and non-conventional procedures. Some of them include random integral programming (MIP) [2], dynamic programming (DP) [3], [4], gradient search method (GSM) [5], particle swarm optimization (PSO) [6], “Quasi-oppositional teaching learning based optimization” [7], “colonel real-coded quantum-inspired evolutionary algorithm” [8] and multi-objective differential evolution method for STHS [9].

In the proposed method following objectives are achieved. A new algorithm is introduced that can minimize the cost of objective function. The proposed algorithm follows the constraints given. Algorithm is capable of identifying the difference between local and global maxima. It is capable of successfully clearing the sensitivity analysis and does not has decreased diversity problem. It has good processing time as compare to the current algorithms.

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List of Abbreviations

MIP	Mixed Integer Programming
GSM	Gradient Search Method
DP	Dynamic Programming
PSO	Particle Swarm Optimization
ED	Economic Dispatch
HTS	Hydro Thermal Scheduling
STHS	Short Term Hydro Thermal Scheduling
CSA	Cuckoo Search Algorithm
LR	Lagrange Relaxation
GA	Genetic Algorithm
SA	Stimulated annealing
DE	Differential Evolution
SPPSO	Small population based PSO
QOTLBO	Quasi-Oppositional Teaching Learning Based Optimization
ISAPSO	Improved Self Adaptive PSO
MDE	Modified DE
CB- MOHDE	Culture Belief Based Multi Objective Hybrid DE
EP	Evolutionary Programming
FEP	Fast EP
MATLAB	Matrix Laboratory
MCSA	Modified CSA