

Non-Convex Multi Objective Economic Dispatch Using Ramp Rate Biogeography Based Optimization

Authors : Susanta Kumar Gachhayat, S. K. Dash

Abstract : Multi objective non-convex economic dispatch problems of a thermal power plant are of grave concern for deciding the cost of generation and reduction of emission level for diminishing the global warming level for improving green-house effect. This paper deals with ramp rate constraints for achieving better inequality constraints so as to incorporate valve point loading for cost of generation in thermal power plant through ramp rate biogeography based optimization involving mutation and migration. Through 50 out of 100 trials, the cost function and emission objective function were found to have outperformed other classical methods such as lambda iteration method, quadratic programming method and many heuristic methods like particle swarm optimization method, weight improved particle swarm optimization method, constriction factor based particle swarm optimization method, moderate random particle swarm optimization method etc. Ramp rate biogeography based optimization applications prove quite advantageous in solving non convex multi objective economic dispatch problems subjected to nonlinear loads that pollute the source giving rise to third harmonic distortions and other such disturbances.

Keywords : economic load dispatch, ELD, biogeography-based optimization, BBO, ramp rate biogeography-based optimization, RRBBO, valve-point loading, VPL

Conference Title : ICEESAO 2017 : International Conference on Exergy, Energy Systems Analysis and Optimization

Conference Location : San Francisco, United States

Conference Dates : June 07-08, 2017