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Improved Artificial Bee Colony Algorithm for Non-Convex Economic Power Dispatch Problem

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Abstract : This study presents a modified version of the artificial bee colony (ABC) algorithm by including a local search technique for solving the non-convex economic power dispatch problem. The local search step is incorporated at the end of each iteration. Total system losses, valve-point loading effects and prohibited operating zones have been incorporated in the problem formulation. Thus, the problem becomes highly nonlinear and with discontinuous objective function. The proposed technique is validated using an IEEE benchmark system with ten thermal units. Simulation results demonstrate that the proposed optimization algorithm has better convergence characteristics in comparison with the original ABC algorithm.

Keywords : economic power dispatch, artificial bee colony, valve-point loading effects, prohibited operating zones
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