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Optimal Generation Costs Considering Modified Sensitivity Factors and Modified Particle Swarm Optimization Version

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Abstract

This paper proposes modified sensitivity factors (MSF) for computing the transmission power flows in terms of buses injected power at different power system events. The proposed MSF are capable for obtaining higher quality solutions. A modified particle swarm optimization (MPSO) version is proposed to solve the power dispatch problem. Comparison studies based on the optimal power dispatch model are performed to show the superiority of the proposed MSF compared to the existed sensitivity factors. In the competitive environment, the use of the proposed sensitivity factors leads to fair allocation of user responsibilities in recovery problems such as loss allocation and transmission usage allocation. The comparison studies are performed using two standard systems, 5-bus and IEEE 57-bus test systems. Also, a real power system as a part of the Unified Egyptian Network (UEN) at Delta region is used to show the superiority of the proposed approach.

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