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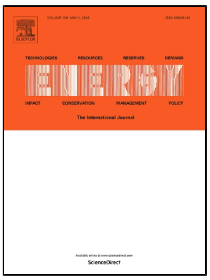

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A Stochastic Mid-Term Scheduling for Integrated Wind-Thermal Systems using Self-Adaptive Optimization Approach: A Comparative Study

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Abstract

In the optimal and economic operation of the power system, generation scheduling is an essential task. Conventional short-term generation scheduling does not regard the huge important operational issues related to the generators, such as initial enterprise costs, maintenance costs, fuel availability, monthly load, etc. Hence, due to the time horizon scheduling of the daily short-term generation scheduling, it is not optimal in the long-term operation while considering the mentioned effects. In this context, this paper proposes a stochastic higher level of scheduling named Stochastic Mid-Term Generation Scheduling of Wind-Thermal systems by considering fixed and variable maintenance costs of generators units. In the proposed model, the 2*m*+1 Point Estimate Method is applied to accurately evaluate the uncertainty related to the operation cost wind power and the load uncertainties for the proposed problem. To effectively solve it, a heuristic algorithm named Adaptive Modified Cuckoo Search Algorithm is employed with a novel self-adaptive Wavelet mutation tactic. To assess the performance of the proposed algorithm on solving the problem, the results are compared with the latest algorithms presented in the literature. Numerical results confirm the efficiency and superiority of the 2*m*+1 point estimate method model and stability of the novel adaptive modified cuckoo search algorithm on solving the stochastic mid-term generation scheduling of wind-thermal systems problem.

Keywords: Generation Scheduling; Stochastic; Point Estimate Method; Wind Power; Cuckoo Search Algorithm; Self Mutation.

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