

Multiobjective Optimal Power Flow Using Strength Pareto Evolutionary Algorithm

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**Universities Power Engineering Conference, 2004. UPEC 2004. 39th
International; Publication Date: 6-8 Sept. 2004; Vol: 1, On page(s): 457- 461 Vol.
1; ISBN: 1-86043-365-0**

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Summary

In this paper, a novel multiobjective evolutionary algorithm for optimal power flow (OPF) problem is presented. The OPF problem is formulated as a nonlinear constrained multiobjective optimization problem where the fuel cost and the voltage stability index are to be minimized simultaneously. A new strength Pareto evolutionary algorithm (SPEA) based approach is proposed to handle the problem as a true multiobjective optimization problem with competing and non-commensurable objectives. A hierarchical clustering algorithm is imposed to provide the decision maker with a representative and manageable Pareto-optimal set. The results demonstrate the capabilities of the proposed approach to generate true and well-distributed Pareto-optimal nondominated solutions in one single run. The results also show the superiority of the proposed approach and confirm its potential to solve the multiobjective OPF problem.

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