Optimal VAR Dispatch Using A Multiobjective Evolutionary Algorithm

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Summary

In this paper, a novel multiobjective evolutionary algorithm for optimal reactive power (VAR) dispatch problem is presented. The optimal VAR dispatch problem is formulated as a nonlinear constrained multiobjective optimization problem where the real power loss and the bus voltage deviations are to be minimized simultaneously. A new Strength Pareto Evolutionary Algorithm 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. Moreover, fuzzy set theory is employed to extract the best compromise solution over the trade-off curve. The results demonstrate the capabilities of the proposed approach to generate true and well-distributed Pareto-optimal solutions of the multiobjective VAR dispatch problem in one single run. The results demonstrate the superiority of the proposed approach and confirm its potential to solve the multiobjective VAR dispatch problem. (C) 2005 Elsevier Ltd. All rights reserved.

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