An ACO Algorithm for Optimal Capacitor Banks Placement in Power Distribution Networks

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Abstract: This paper aims to present and apply an algorithm based on Ant Colony Optimization (ACO) for optimal allocation of capacitor banks in electric power distribution networks. A nonlinear function based on costs is used as a criterion of the mathematical optimization model. Also the model imposes equality constraints described by the network operating equations and inequality constraints required to maintain within admissible limits the parameters characterizing the system state. The algorithm is applied for a test-network having 35 nodes, the results indicating its validity and efficiency.

Keywords: Ant colony optimization algorithm (ACO), capacitor banks placement, power loss reduction