

# Cost/Benefit Analysis for Installation of Capacitor and Distributed Generator with Network Reconfiguration considering Load Growth and Variations

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## Abstract

The load demand at distribution network (DN) is increasing day by day due to increase in industrial, commercial, municipal, residential and irrigation needs. In order to meet the increased load demand in DN, distributed energy resources i.e., Distributed Generators (DG), Capacitors and Network reconfiguration are used as alternative solutions. In this paper, an attempt has been made to maximize the economic benefits in distribution system with installation of DGs, Capacitors and Network reconfiguration by simultaneously optimizing the location, size, switching configuration while taking into account, the load growth and the variations in load in DN also. Optimal location and capacity of DG and Capacitor is a difficult non differentiable combinatorial optimization problem. Adaptive Quantum inspired evolutionary Algorithm (AQiEA) has been used to solve the difficult non differentiable, combinatorial optimization problem. The effectiveness of AQiEA is tested with a benchmark test bus system i.e., 33 bus system. In this study, two different cases are considered to test the effectiveness of proposed algorithm. Seven different Scenarios are considered to analyse the losses incurred in the system with variation in load in first case. The effectiveness of the proposed algorithm as compared with other algorithm is demonstrated on the other case.

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