

## OPTIMAL SITING AND SIZING OF HYBRID DISTRIBUTED GENERATION USING FUZZY-EP

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### ABSTRACT

Distributed generation (DG) is increasingly becoming more important in the power system because of its high efficiency, small size, low investment cost, modularity and most significantly, its ability to exploit renewable energy sources. The loads of the system are uncontrolled and depend on voltage and frequency of the system. Therefore, analysis assuming constant power loads will give misleading and inaccurate results. This paper addresses the voltage sensitiveness of the loads by incorporating voltage dependent load models in the analysis. Three types of DGs are considered for implementation and DGs are modelled as PQ bus. The suitable location for placing distributed generation (DG) is identified through loss sensitivity factors and L index. The fuzzy adaptation of evolutionary programming is used to find the optimal size of distributed generation (DG). The objective of this paper is to minimize the total payments toward compensating for system losses and DG's capital costs by optimal siting and sizing of three types of DG for a mixed realistic load model. This new technique is tested on IEEE-34 bus radial distribution system and the results obtained justify the importance of optimal placement of distributed generation (DG) for minimizing losses and maximizing saving while maintaining appropriate voltage profile at all the buses.