Abstract

Electric power is one of the inherent things in the modern world. Recently, the renewable and non-renewable energy based Distributed Generator (DG) units are used for generation of electric power to satisfy the local load of the distribution system. This paper proposes a chaotic artificial bee colony (CABC) algorithm based optimal placement and sizing of various categories of DGs that are simultaneously placed in the distribution system according to their technical benefits and planning aspects. Four different types of DGs, such as capable of supplying real power only, capable of supplying reactive power only, capable of supplying real and reactive power, capable of supplying real power and absorbing reactive power has been considered in this approach. The objective is to reduce the resource cost and network loss in such a way that line flows should be within limit and to improve the voltage profile and stability of the system. The Voltage Stability Index (VSI) is used to identify the most sensitive node in the system. The constant power and other voltage dependent load models such as industrial, residential and commercial are considered for this work. The efficiency of the proposed method is tested on 38-node and 69-node radial distribution systems.


Index Terms
Keywords

Chaotic artificial bee colony, load models, distributed generation, distribution system, cost, voltage stability.