

A critical review of strategies for optimal allocation of Distributed Generations units in Electrical Power Systems

ABSTRACT

Recent research has shown that installation of distributed generation (DG) units in the utility's distribution system of a power network would lead to attainment of numerous potential benefits. To maximise these benefits, it is crucial to find the optimal number or size of DG units and their appropriate locations in power distribution systems, since siting DG units in improper locations could jeopardise the system operation. However, the task to determine the optimal size and sites of DG sources in power systems is not an easy one, due to a number of factors. In tackling this problem, many approaches have been proposed by various researchers in recent years. This paper presents a critical review of different methodologies employed in solving this optimisation problem. For ease of reference, and to facilitate understanding, this literature categorises and discusses the various existing approaches into five different major headings. They are: the analytical approaches, the meta-heuristics, the genetic algorithms (GAs) approach, the GA-hybrids, and finally those that are categorised as other approaches. The benefits, as well as the drawbacks of each approach are thoroughly examined in the paper.

Keyword: Distributed Generation, Optimal Placement, Genetic Algorithms, Meta-Heuristics, Analytical Approaches, GA-Hybrids