

Novel Optimization Approach to Distributer Generator Placement for Reducing Loss

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Abstract: To meet the increasing load demand requirement, the process of distributed generation (DGs) is integrated into distribution systems. The main objective of the system is to minimize the loss caused by the active and reactive power and to boost the overall voltage profile of the system. In power distribution network, the increased load demands is the major cause for the distribution systems to operate very closely to boundaries of voltage instability. When the DG units get integrated into distribution system, the network experiences various impacts based on its parameters such as power quality, power flow, voltage profile, stability, protection, and reliability. The problem of voltage stability and load flow loss are the major challenges for the power industry. In power distribution system, the issue of voltage instability is related to dynamics of the load flow, thus it requires distinct forms of load characteristics to deal with voltage stability as well the losses occurring during its process analysis. In modern electrical power systems, the injection of reactive power plays a significant role in power or load flow analysis and control of voltage stability, thus the losses based on reactive power are required to get incorporated in DG optimization process in order to improve the voltage profile. Many algorithms have been proposed to emphasize load flow losses and improve the voltage profile of the system. The proposed work involves the use of Grey Wolf Optimization (GWO) with genetic algorithm (GA) algorithm employed for obtaining restructured power distribution network (PDS) and helps in identification of optimal switches/transforms corresponding to power (minimum) loss in distribution network systems.

Keywords: Distributed Generation, Grey Wolf Optimization, Genetic Algorithm, Power Distribution Network

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