

Boonyarit Thongpull 2009: Optimal Siting and Sizing of Distributed Generator for Loss Reduction Considering Fault Level in Distribution Network Systems.
Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Parnjit Damrongkulkamjorn, Ph.D. 125 pages.

This thesis presents a method for optimal siting and sizing of distributed generator (DG) in distribution systems. The methodology applies the Genetic Algorithm (GA) taking into account load flow analysis in order to minimize system losses under different load levels. Minimum system losses are obtained subject to voltage constraints, line flow limits and fault levels. The fault level constraints are considered from the rating of protection equipment. The fault levels are calculated from the capacity and subtransient reactance of DG. The methodology is tested on 26-bus and 59-bus radial systems modified from PEA distribution systems. The test results show that the optimal siting and sizing of DG could be found. The optimal DG therefore reduces losses in distribution system, resulting in voltage level improvement and line flow reduction. However, when fault level is taking into consideration, the optimal size of DG may be smaller, and the optimal location of DG may be differed.

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Thesis Advisor's signature

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