Optimal placement and sizing of DFIG-based wind farms, fuel cell, photovoltaic units by using particle swarm optimization algorithm and fuzzy logic

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Abstract:

The Renewable Energy reasons to economical issues, environmental and rising demand of energy consumption are expanding the day to day. Due to capabilities-aligned decentralized this equipment, Placement program and sizing its, important problem of power system operation. In this paper, a combined approach is presented for optimal placement and sizing recent technology developments of photovoltaic units, DFIG based wind turbine and fuel cell units, only these generators are considered. This work presents a multi objective optimization algorithm for the sitting and sizing of renewable electricity generators. The objectives consist of minimization of costs, active and reactive losses of distributed system. Optimal Placement and sizing of the equipment is carried out by using Particle Swarm Optimization algorithm continuously. Fuzzy logic is used in order to compare the composition of active and reactive losses in optimization. In this paper, softwares DIgSILENT/MatLab , which has bilateral information relation, is also used for the simulations. The studies are executed on a typical IEEE 33 bus test system. The results show that the proposed algorithm can improve performance & efficiency of system.

keywords **:** Renewable electricity generator (REG), Optimal placement and sizing, Particle swarm optimization, DIgSILENT, Fuzzy logic

[DOR: 20.1001.1.23222468.1391.1.3.7.3]
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Journal of Novel Researches on Electrical Power - Vol. 1-No. 3- winter 2012