

Distribution Network Optimization by Optimal Placement of Photovoltaic-Based Distributed Generation: A Case Study of the Nigerian Power System

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Abstract : This paper examines the impacts of the introduction of distributed energy generation (DEG) technology into the Nigerian power system as an alternative means of energy generation at distribution ends using Otovwodo 15 MVA, 33/11kV injection substation as a case study. The overall idea is to increase the generated energy in the system, improve the voltage profile and reduce system losses. A photovoltaic-based distributed energy generator (PV-DEG) was considered and was optimally placed in the network using Genetic Algorithm (GA) in Mat. Lab/Simulink environment. The results of simulation obtained shows that the dynamic performance of the network was optimized with DEG-grid integration.

Keywords : distributed energy generation (DEG), genetic algorithm (GA), power quality, total load demand, voltage profile

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