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Optimum allocation of distributed generation units in distribution power grids with line losses and voltage sag considerations

Moussa, S.A.M.[a], Abdelwahed, A.[b]

[a] Department of Electrical Engineering, University of Pharos, Alexandria, Egypt

[b] Mathematics and Physics Department, Faculty of Engineering, Alexandria University, Alexandria, Egypt

Abstract:

This paper presents a method for optimum allocation of a number of Distributed generation (DG) units in distribution system (DS). The main aim of the present work is to draw attention to some effects of DG's installation on DS. These effects are studied in both normal steady state operation (line power losses) and transient periods (voltage sag losses). As a matter of fact addition of DG to DS decreases grid losses, however it is highly probable that this addition will increase the losses of voltage sags resulting from short circuit (S.C.) on any bus of DS. This makes it important to include the voltage sag losses in optimum allocation problem. The paper applies the conventional particle swarm optimization (PSO) technique with two modifications. The proposed method is applied to the IEEE 14-bus system. Results ascertained contradictive effects of DG installation between line and voltage sag losses which assured the importance of voltage sag consideration in the problem of DG allocation. © 2016 IEEE.

Reference:

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