

Influence of Distributed Energy Resources on Grid Voltage Quality using Model IEEE 13 busbars

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Influence of Distributed Energy Resources on Grid Voltage Quality using Model IEEE 13 busbars

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Distributed generation is already a technology used by a portion of consumer units in the country, that number promises to increase after the enactment of legislation pertinent to the subject. Therefore, is essential to observe the impact of the power flow changes in the characteristic of the others electrical measurements. The study seeks to put more attention on the effects related to voltage quality in the distribution network. Computational tools were used to simulate the insertion of generators at different points in the network, openDSS was the selected program for running the simulations, one of the benefits of it is the open source code, and the standard network model of thirteen bars of the IEEE was chosen to carry out the tests. The sources were modeled according to the load power associated with it and some scenarios were developed to analyze the voltage profile obtained in each of the proposed situations. In the first scenario sources were connected only at the ends of the network, in the second only at points that had not been covered yet, in a third all loads received associated generators. Finally, in the fourth scenario, spawn points were allocated at random places within a quarter of the third scenario. For comparison purposes, the standard system was also simulated at the same voltage parameters measure. The simulations performed showed significant improvements in voltage levels, mainly at the ends where the values tend to decrease, but each situation presented a different profile and some topologies proved to be more beneficial for the model. Thereby, with the expansion of distributed generation, there will be a need to evaluate the position of generation in the grid, in addition to the technical requirements already foreseen.

Keywords: renewable sources, IEEE 13 busbar, distributed generation, power quality, openDSS.

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Experience In The Use Of Network Topology As A Basis For Electrical Calculations In Distribution Networks

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The experience in the use of network topology analysis tools available in geographic information systems (GIS), for the simulation of operations and determination of supplied areas in distribution