

Power quality considerations for embedded generation integration in Nigeria: A case study of ogba 33 kV injection substation.

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- **Abstract:** The deregulation of the Nigerian power sector has resulted in the quest to explore power generation options for power quality improvement. One of such options is the pattern shift from central power generation to embedded power generation. Network integration of embedded generators (EGs) causes several regulatory, technical and economic issues. This research focuses on power quality challenges that may arise as a result of network integration of embedded generation in a weak electricity networks using Ogba 33 kV injection substation as case study. The embedded generators considered comprised of gas turbine and diesel generators. NEPLAN software was used to perform the load flow analysis with and without EGs connection on the network. This was necessary so as to ascertain the healthiness of the existing distribution network for EGs integration. The power quality issues considered in the study were bus voltage profiles and the total line losses. Simulation results showed that EGs connection improved the voltage profile, for example, bus voltage at PTC 11 kV, improved from 0.881 pu to 0.958 pu while the total active power loss was reduced by 78.16%. The results obtained suggest that the grid is healthy enough to accommodate the EGs with no quality issues.
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