Evaluation of Voltage Stability Indices

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Abstract

Voltage security/stability appraisal and control are not regarded as new issues. Nevertheless, they rather gained unusual attention to preserve the stability of power transmission networks and evade repeat of major power outages as experienced in some countries(like United States, Canada, Belgium, Sweden, Tokyo, Tennessee). Voltage stability evaluation is indispensable in monitoring power system stability. For ten (10) years, the Nigeria National Gird (NNG) has experienced a total of 29.3 collapses. This work demonstrates a comparison of six voltage stability indices referred to as a line (i.e., Lmn, FVSI, LQP, Lp, NVSI, and NLSI_1); it shows their advantages and disadvantages. The effectiveness of these indices is evaluated via numerical studies in the IEEE 14-bus test system under diverse loading situations. From the study of these indices, a suitable index would be chosen to monitor the Nigerian power system.

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