

Comparative Study of Line Voltage Stability Indices for Voltage Collapse Forecasting in Power Transmission System

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Abstract : At present, the evaluation of voltage stability assessment experiences sizeable anxiety in the safe operation of power systems. This is due to the complications of a strain power system. With the snowballing of power demand by the consumers and also the restricted amount of power sources, therefore, the system has to perform at its maximum proficiency. Consequently, the noteworthy to discover the maximum ability boundary prior to voltage collapse should be undertaken. A preliminary warning can be perceived to evade the interruption of power system's capacity. The effectiveness of line voltage stability indices (LVSI) is differentiated in this paper. The main purpose of the indices is used to predict the proximity of voltage instability of the electric power system. On the other hand, the indices are also able to decide the weakest load buses which are close to voltage collapse in the power system. The line stability indices are assessed using the IEEE 14 bus test system to validate its practicability. Results demonstrated that the implemented indices are practically relevant in predicting the manifestation of voltage collapse in the system. Therefore, essential actions can be taken to dodge the incident from arising.

Keywords : critical line, line outage, line voltage stability indices (LVSI), maximum loadability, voltage collapse, voltage instability, voltage stability analysis

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