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Coordinated Voltage Control in Radial Distribution System with Distributed Generators Using Sensitivity Analysis

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Abstract : Distributed generation has indeed become a major area of interest in recent years. Distributed generation can address a large number of loads in a power line and hence has better efficiency over the conventional methods. However, there are certain drawbacks associated with it, an increase in voltage being the major one. This paper addresses the voltage control at the buses for an IEEE 30 bus system by regulating reactive power. For carrying out the analysis, the suitable location for placing distributed generators (DG) is identified through load flow analysis and seeing where the voltage profile is dipping. MATLAB programming is used to regulate the voltage at all buses within +/- 5% of the base value even after the introduction of DGs. Three methods for regulation of voltage are discussed. A sensitivity based analysis is then carried out to determine the priority among the various methods listed in the paper.

Keywords : distributed generators, distributed system, reactive power, voltage control, sensitivity analysis
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