

A Corrective Load Shedding Scheme to Mitigate Voltage Collapse

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Abstract-

Voltage stability is concerned with the ability of a power system to maintain acceptable voltages at all buses. A measure of the power system voltage stability is the distance to the saddle node bifurcation of the power flow equations, which is called the load margin. When the power system load is very high, and/or there exists a large generation-demand imbalance in the power system areas the load margin to the saddle node bifurcation may be too low, and the power system may become close to voltage collapse. In case that active and reactive power generation resources in the importing areas are exhausted, corrective load shedding may become the last option. This paper presents a LP-based optimization load shedding algorithm to improve the load margin. The objective function consists of minimizing the total system demand decrease. First order sensitivities of the load margin with respect to the load to be shed are considered. The performance of the method is illustrated with a scenario of the Spanish power system.

Index Terms- Voltage Stability; Load Shedding; Optimization.

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