A security-constrained decomposition approach to optimal reactive power planning

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Abstract-

A two-level decomposition technique for VAr (voltampere reactive) sources planning in electric power systems is presented. Several operating conditions of the system (different base cases with associated contingencies) can be considered simultaneously. Total flexibility in the corrective or preventive treatment for control variables is provided. New VAr sources are modeled by discrete variables, and the operating and investment costs are discussed in detail. Examples of applications to actual cases of reactive compensation planning in a large power system are reported to demonstrate the efficiency and capabilities of the approach

Index Terms- Power system planning, optimization, decomposition, voltage control, VAR control.

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