A power system, during disturbances, is at risks of voltage instability due to insufficient reactive power reserves. Reactive power reserve management is a reliable indicator of voltage security of power networks. This paper proposes a Particle Swarm Optimization (PSO) based optimal reactive power reserve management task incorporating only one type of FACTS device. Optimal placement of multi type FACTS devices can naturally manage the reactive power reserves. But for large size power systems, this becomes a tedious work owing to the mathematical complexities and much time for obtaining the optimal results. Optimal location and parameter setting of multiple TCSCs is considered for an acceptable and suboptimal solution for reactive power reserve management. Particle swarm optimization technique optimizes the location and size of TCSCs. The effectiveness of the proposed work is tested for IEEE-30 Bus test system with multiple TCSC devices. It has also been observed that the proposed algorithm
can be applied to larger systems and do not suffer with computational difficulties.

Reference

Particle Swarm Optimization Algorithm for Voltage Stability Enhancement by Optimal Reactive Power Reserve Management with Multiple TCSCs


Index Terms
Computer Science Power Systems

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