MARKET CLEARING CONSIDERING POWER SYSTEM SECURITY

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Abstract. In this paper, a new technique based on Particle Swarm Optimization (PSO) is proposed to incorporate voltage stability limits into traditional optimal power flow (OPF) formulations. Two objective functions such as fuel cost and voltage stability margin (loadability) are considered to be optimized. In proposed method system's maximum loading margin (loadability) is calculated by continuation power flow (CPF). Particle swarm optimization (PSO) is employed to solve the proposed multi-objective OPF problem. The proposed method allows system operators in order to control the desired level of system security via adjusting the weighting factors of the different objective functions directly. Simulation results for the IEEE 30-bus test system demonstrate the effectiveness of the PSO in solving multi-objective OPF problems.

Keywords: Electricity markets, system security, loadability, Particle Swarm Optimization