Voltage stability is the ability of a power system to maintain acceptable voltages at all nodes in the system under normal condition and after being subject to a disturbance which has a closely relationship with the reactive power of the system. This paper presents an algorithm for solving the voltage stability and Reactive Power Dispatch problem in a power system. The Cat Swarm Optimization algorithm employs for optimal settings of Reactive Power Dispatch control variables. Cat Swarm Optimization algorithm is applied on Iraqi Super High Voltage grid system and the results are compared with Particle Swarm Optimization algorithm. As a result, the proposed method was shown to be the best for solving Optimal Reactive Power Dispatch problem and hence the voltage stability enhancement.


**Index Terms**

Computer Science  
Power Systems

**Keywords**

ORPD problem, voltage stability enhancement, PSO, and CSO.