Abstract

Recent day power system networks are having high risks of voltage instability problems and several network blackouts have been reported. This phenomenon tends to occur from lack of reactive power supports under heavily stressed operating conditions caused by increased load demand and the fast developing deregulation of power systems across the world. This paper proposes an application of Shuffled Frog Leaping Algorithm (SFLA) based extended voltage stability margin and minimization of loss by incorporating TCSC and SVC (variable susceptance model) devices. The line stability index (LQP) is used to assess the voltage stability of a power system. The location and size of Series connected and Shunt connected FACTS devices are optimized by shuffled frog leaping algorithm. The results are obtained from the IEEE-30 bus test case system under critical loading and single line outage contingency conditions.

**Index Terms**

Computer Science  
Power Systems

**Keywords**

Shuffled Frog Leaping Algorithm  
Facts Devices  
Line Stability Index  
Tcsc  
Voltage Stability  
Svc