Abstract

With the introduction of competition in the existing electrical market, it became necessary to increase the capability of transmission of power through the existing transmission lines. This paper describes a method of improving reliability of composite power system by increasing transmission system capability using FACTS devices. The utilization of FACTS [1] technologies will have a significant positive impact on power system performance in terms of reliability. Considerable efforts have been made in the past for developing techniques to evaluate composite power system reliability. The proposed method is based on the probabilistic approach to determine the load point reliability indices in a practical system. Composite system reliability can be increased by adjusting the settings of the FACTS device (such as reactance, phase angles, reactive power injection) with respect to the system parameters. In this paper, the settings of TCSC are obtained using Particle Swarm Optimization technique. The settings thus obtained are used for enhancing the transmission power capacity while improving the composite power system reliability. The proposed scheme is tested on Roy Billinton Test System (RBTS).
Particle Swarm Optimization based Control Setting of TCSC for Improving Reliability of Composite Power System

Index Terms

Computer Science

Power Systems

Keywords

Flexible AC Transmission System (FACTS) Thyristor controlled series capacitors

(TCSC) Particle Swarm Optimization

technique (PSO) Loss of load

probability (LOLP)