Abstract

This paper addresses the optimal placement of static var compensators (SVCs) in a power system network in such a manner that power loss, voltage deviation and installation cost is minimized. Voltage deviation is minimized by improving voltage profile. The aim of this study is to minimizing the power loss, voltage deviation and installation cost under critical contingency and increasing load condition in power system network. The multi-objective function is carried out in this study. RCGA is used to solve the optimization problem in this paper which is one of the heuristic methods. Real Coded Genetic Algorithm optimization helps in determining the location of the SVC. The proposed approach has been tested on IEEE-30 Bus test system with different objectives. It has also been observed, we can apply this algorithm to larger systems with computational difficulties. The obtained results show that the suggested method of SVC placement is effective in reducing the real power loss, voltage deviation and installation cost during normal as well as critical contingency cases.

References


- Pavlos S. Georgilakis, Peter G. Vernados; Flexible AC Transmission System Controllers: An Evaluation; in Materials Science Forum, Switzerland, 2011.

- Shishir Dixit, Ankita Singh; An Overview of Placement of TCSC For Enhancement of Power System Stability; in IEEE International Conference on Computational Intelligence and Communication Networks (CICN-2014), Nov 08-10, 2014, JRNRV University, Udaipur.


- S. Sakthivel, Dr. D. Mary, R. Vetrivel, V. Senthamarai Kannan; Optimal Location of SVC for Voltage Stability Enhancement under Contingency Condition through PSO Algorithm; in International Journal of Computer Applications (0975 – 8887), Tamil Nadu, India.

- Reza Sirjani, Azah Mohamed, Hussain Shareef; Optimal placement and sizing of Static Var Compensators in power systems using Improved Harmony Search Algorithm; Kebangsaan Malaysia (UKM).


- M. A. Abido; Optimal Power Flow Using Particle Swarm Optimization;

- Mugdha Bhandari, Sri. G. N. Madhu; Genetic Algorithm Based Optimal Allocation of SVC for Reactive Power Loss Minimization in Power Systems;

- K. Vijayakumar, Dr. R. P. Kumudinidevi; A New Method For Optimal Location Of Facts Controllers Using Genetic Algorithm; in Journal of Theoretical and Applied Information Technology.


- El. M M. Metwally, El. AA. Emary, El. FM. Bendary and M. I. Mosaad; Optimal allocation of FACTS devices in power system using genetic algorithms;

- Shishir Dixit, Laxmi Shrivastava, Ganga Agnihotri; Optimal Location and Sizing of STATCOM for minimizing power loss and improving voltage profile using GA;

- Shishir Dixit, Laxmi Srivastava, Ganga Agnihotri; Optimal Allocation of SVC for Minimization of Power Loss and Voltage Deviation using NSGA-II; in International Journal
- R. Benabid, M. Boudour, &quot;Optimal Location and Size of SVC and TCSC for Multi-objective Static Voltage Stability Enhancement&quot; Algiers (Algeria).
- Shishir Dixit, Laxmi Shravastava, Ganga Agnihotri, Rahul Dubey, &quot;Ideal Location of Shunt FACTS Devices Using Heuristic Optimization Techniques: A Literature Survey&quot;.
- S. Chansareewittaya, P. Jirapong, &quot;Power Transfer Capability Enhancement with Multitype FACTS Controller Using Particle Swarm Optimization,&quot; in Proc IEEE TENCON 2010.

Index Terms

Computer Science

Artificial Intelligence
Placement of SVC for Multi-objective Function using RCGA

Keywords
FACTS devices  Genetic Algorithm  SVC  Voltage Profile  Voltage deviation  Power Loss  Installation Cost