CHAPTER 5

CONCLUSION AND SCOPE FOR FUTURE WORK

5.1 INTRODUCTION

This chapter presents the results and conclusions with respect to the realization of the proposed objectives of this research work. The scope for future research work for optimal SVC setting for voltage stability enhancement using biologically inspired optimization techniques is also stated.

5.2 OPTIMAL SVC SETTING FOR VOLTAGE STABILITY ENHANCEMENT USING BIOLOGICALLY INSPIRED OPTIMIZATION TECHNIQUES

The main objective of this research work is to obtain the optimal location and susceptance rating of SVC to enhance voltage stability. Biologically inspired optimization techniques GA, PSO and hybrid PSOGA are used to solve the multi-objective optimization problem. This multi-objective optimization problem has five objective functions such as minimization of voltage stability index, total power loss, load voltage deviation, cost of generation and cost of SVC device and subjected to the operational constraints. The proposed algorithm is verified with IEEE 14 bus, IEEE 30 bus, IEEE 57 bus and IEEE 118 bus power systems. Results are

obtained from biologically inspired optimization techniques and compared with conventional method and other researcher results.

5.2.1 Identification of Location of SVC Using Conventional Method

In this research work, L-index conventional method is used for identifying location of SVC. Simulations were performed on IEEE 14 bus, IEEE 30 bus, IEEE 57 bus and IEEE 118 bus systems.

5.2.2 Optimal Location of SVC Using Biologically Inspired Optimization Techniques

This research proposes algorithms for GA, PSO and hybrid PSOGA to find the optimal location and size of SVC device for decreasing voltage stability index, real power loss, voltage deviation, cost of generating units and cost of SVC device. Simulations were performed on IEEE 14 bus, IEEE 30 bus, IEEE 57 bus and IEEE 118 bus systems for different load scenarios. It is observed from the results that all the methods used in this research can give results with regard to the five objectives of this research work. But hybrid PSOGA results are better than that of GA, PSO and conventional method.

5.3 SCOPE FOR FUTURE WORK

Static voltage stability analysis has been carried out in this research work whereas future studies can be carried out on dynamic voltage stability analysis. In this work, disturbance is created as load increase for investigating voltage stability of the power system; in future work, voltage stability can be analysed for contingency conditions.

GA, PSO and hybrid PSOGA biologically inspired optimization techniques were used in this research work to solve multi-objective functions. The same research work can be extended with other biologically inspired optimization techniques like tabu search, simulated annealing, ant colony optimization, harmony search algorithm and hybrid of biologically inspired optimization techniques.

In this research work, optimal location and susceptance rating of SVC are obtained; these two objectives can be tried with other types of FACTS devices. In future work, practical (existing) power system and IEEE power systems can be used to assess voltage stability.