APPLICATION OF ARTIFICIAL NEURAL NETWORK FOR DETERMINING COMPENSATING CAPACITOR LOCATION, SIZING LOSS MINIMIZATION IN A POWER SYSTEM

Project report is presented in partial fulfillment for the award of the Bachelor of Electrical Engineering (Hons.)

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ACKNOWLEDGEMENT

Alhamdulillah, all praise to Allah S.W.T, The Most Gracious and Most Merciful who has given me the strength, ability and patience to complete this project. I would like to convey my deepest gratitude and appreciation to my project supervisor, Dr. Titik Khawa bt Abdul Rahman for her invaluable suggestion, guidance and advice for the completion of this project and also lectures who has given encouragement to make this a success.

Last but not least, my friend thanks to all friends for the valuable help and motivation given in completing this project. Most of all to my beloved family, especially my father and my mother who dearest person in my life and greatest source of inspiration, thank you for the endless love and encouragement they have given and for being so understanding.

ABSTRACT

Recently research has shown that ANN is promising solution to many applications especially for non-linear problem in power system, which is difficult for conventional technique. The potential of application of ANN as an alternative approach for solving certain difficult power system problem where conventional methods have not achieved desired speed couldn't be understand.

This report presents an application of Artificial Neural Network for determining compensating capacitor location, sizing and power loss minimum in power system. This training data was obtain from calculated capacitor location, sizing and power loss with Newton-Raphson method using Borland C++ program and apply to the artificial neural network using Back-propagation method in the MATLAB. The proposed technique was tested on 6 bus system.

The result shows that the proposed ANN technique is highly accurate and capable predict at faster rate.

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CHAPTER 1

INTRODUCTION

1.0 Background

The reactive power Q is the component of power that is exchange back and forth between source and a load. By, convention, positive reactive power is consumed by inductive loads (+Q) and negative reactive power is consumed (or positive reactive power is supplied) by capacitive loads (-Q).

The reactive power is important for the modern power system to operate in a reliable and economic way because it is the voltage control in power system. The proposed of the reactive power injected is to get the capacitor location, sizing and minimum power loss in power system.

Artificial Neural Network is now widely being used in power system application. ANN models are based on the activity in the human brain such as learning, generalization, evaluation, recognition and complex control.

Recent research has shown that artificial neural network (ANNs) is a promising solution to many applications that are difficult for conventional computers [2]. The first artificial neuron was produced in 1943 by the neurophysiologist Warren McCulloch and the logician Walter Pits.

An artificial neural network consist of a collection of processing elements that are highly interconnected and transform a set of inputs to a set of desired outputs. The results of the transformation are determined by the characteristics of the elements and the weights associated with the interconnections among them. By modifying the connections between the nodes the network is able to