SOLVING LOAD FLOW SOLUTION USING EVOLUTIONARY

PROGRAMMING METHOD

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ACKNOWLEDGEMENT

ABSTRACT

The load flow problem can be expressed a set of nonlinear simultaneous algebraic equations, then it is impossible to have multiple solutions. To overcome the limitations of conventional load flow problem, a genetic based load flow optimisation is developed.

This report presents an alternative method for solving the load flow using the evolutionary programming (EP) method. The principal information obtained from a power-flow study is the magnitude and phase angle of the voltage at each bus and the real and reactive power flowing in each line. The EP developed uses the total active and reactive power mismatches as the objective functions for the load flow solution. It is found that the result from the EP are closed to these obtained from the traditional method

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CHAPTER 1

INTRODUCTION

1.1   Introduction

The power flow study of an electrical power system is also known as a "load"flow study. The load flow problem is one of the basic problems in power engineering. Load flow studies are routinely used in planning, control and operations of existing power system as well as planning for future expansion. The load flow solution is not unique since it can be expressed as set of non-linear simultaneous algebraic equations. In general, the load flow problem has many possible solutions or no solutions. Usually, only one normal solution has voltage magnitudes near the nominal voltage values. By contrast, the other solutions usually contain one or more bus voltages near zero. The load flow has been studied widely. The conventional method for solving the load flow problem involves Gauss Siedel, Newton Rahpson and fast Decoupled [1].

Evolutionary programming is a computational intelligence method to solve an optimization problem, which is the main engine for the process of three step namely natural selection, mutation and competition. EP is useful method for optimization when other techniques such as gradient decent or direct, analytical discoveries are not possible. There has been great interest in the use of EP in power system because these approaches are very well suited deal with all those kinds of problem that usually represent multiple objectives, non linear function and etc [2].

Therefore, in this report, evolutionary programming method is proposed to solve the load flow solution. Evolutionary programming for this purpose clear advantage over traditional methods due its robustness, since it does not need any special coding of individuals as in the Genetic Algorithm. Each of the individuals