ECONOMIC DISPATCH USING ARTIFICIAL IMMUNE SYSTEM

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ABSTRACT

This project presents an Artificial Immune System based approach to solve economic dispatch problem *in* a power system. The Artificial *Immune* System developed in the project was tested on two objective functions for optimizing the economic dispatch problem that are the total generation cost and the incremental cost function. The performances of the two objective functions were compared in term of minimizing the total cost of generation in satisfying the load demand together with the transmission losses. The effectiveness of this technique was tested on the IEEE 26-bus system and analysis of results is presented.

CHAPTER 1
INTRODUCTION

1.1 Background

There are many factors involved in the successful operation of a power system. The system is expected to have power instantaneously and continuously available to meet consumersf demands. It is also expected that the voltage supplied to the consumers will be maintained at or near the nominal rated value [1].

In a large plant and certainly over an entire power system many generators may cooperate in meeting the power needs of all the connected loads. Often these generators are installed over a period years as the plant or power system expands to meet the growing needs of consumers. As a result many generators have fuel rate conversion characteristics that can be significantly different, which means that some generators are capable of producing more electrical output per unit of heat energy than others [2].

In operating the system for the any load condition the contribution from each plant and from each unit within a plant must be determined so that the cost of delivered is minimum. An early method of attempting to minimize the cost of delivered power called for supplying power from only the most efficient plant at light loads. As load increased, the most efficient plant would supply power until the point of maximum efficiency of that plant was reached. Then for further increase in load the next most efficient plant would start to feed power to the system, and a third plant would not be called upon until the point of maximum efficiency of the second plant was reached. Even with transmission losses neglected this method fails to minimize cost [3]. The problem of minimization the cost generation in operating system is called economic dispatch problem.

' Basically economic dispatch is a constrained nonlinear dynamic problem, which was made difficult by an uncertain environment. Two directions have been pursued in the