THESIS TITLE : SOLVING UNIT COMMITMENT PROBLEM USING

GENETIC ALGORITHM

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ABSTRACT

This thesis proposes a genetic algorithm for solving a unit commitment problem. The genetic algorithm is a stochastic optimization technique. The genetic algorithm in this thesis was refined from the simple genetic algorithm by modifying the internal processes. The modified processes include reproduction, crossover and mutation processes. The proposed genetic algorithm also include other additional operations such as the chromosome exchanging operation, a hill-climbing operation and a modified mutation operation. In order to improve the performance of the proposed algorithm, the program was developed using C++ on the windows platform. The six studied cases were tested, each of which has different constraints and different numbers of thermal generator units (10, 26 and 100 units).

The results yield good answers for 10 and 26 units when compared to those solved by the priority list method. The 100 unit problem yields a good answer when combining the priority list method into the genetic algorithm. The advantage of combining the priority list method into the genetic algorithm is to decrease the number of generations and chromosomes. This results in reducing computational time.