Optimization of Economic load Dispatch

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Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Master of Science
in
Electrical Engineering

Abstract

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Electricity demand is increasing daily, due to the rapid growth of electrical and electronics products in market. The main objective has now shifted to improve the performance, lower the cost of solution and to make reliable power system. To meet the increasing demand of electrical load, new conventional and nonconventional generation's systems are needed to install. Due to the rapid changes in modern world, energy shortage is a big issue. Due to depleting conventional sources with time, energy experts are interested in renewable energy sources. In order to ensure the stability of power system, demand and generation must be balanced. Hence, the economical load dispatch technique is applied to define the optimal solution for generation units, power output, and to minimize the operating fuel costs of these units.

Economic load dispatch problem is complex, when Renewable energy units are also considered with thermal power plant. This thesis is mainly aimed to design Economic load dispatch model for thermal and wind power plants. Thepurposed optimization method is Genetic algorithm (GA).This approach is based primarily on using MATLAB in implementing the genetic operators: crossover, mutation and selection.The main idea behind Genetic algorithm is that, all generators will optimally supply the required electricity load demand at minimum fuel cost, while satisfying the system constraints. This paper discusses the concept and design procedure of Genetic Algorithm as an optimization tool. The simulations were performed on various test systems, one with six thermal generators and the other with six thermal generators and wind power unit.

Dedicated to my parents, who always wants me to study further.

Acknowledgement

Primarily, I would like to express my sincere gratitude to my supervisors Prof. Dr. Abdul Aziz Bhatti and Muhammad Fahad Zia for providing an opportunity to conduct my master thesis under their supervision. Their thoughtful guidance, endless support, incentive motivation, insightful criticism and immense knowledge have been beneficial throughout my thesis.

My deepest gratitude goes to my mother. This is because of her love, endless support and prayers. I would like to thank my brothers and sisters for invaluable support, ever-existing love and encouragement. This would never have been possible without my family support. I love you all.

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