IMPLEMENTATION AND ANALYSIS OF ECONOMIC LOAD DISPATCH USING KRILL HERD ALGORITHM

By

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Abstract

The importance of economic load dispatch (ELD) problems in electric power operation emphasizes to be solved effectively so that an efficient plan for power generation could be developed for a given load demand. In real life scenarios, non-linearity and complexity of ELD cost function make it a hideous task to be solved effectively. In this research work, a nature inspired optimization algorithm (Krill Herd Algorithm (KHA)) is efficiently implemented for different ELD problems involving complex and convex functions. Different test systems of thermal power generating units involving active power limits, transmission loss, and valve point loading constraints are considered for the implementation of the optimization algorithm. A statistical comparison of the results obtained by the implemented algorithm with different optimization techniques already developed is also made to analyze the efficiency of the KHA. By comparing the outcomes, it is observed that the implemented KHA is far better in robustness and efficiency than other previously implemented algorithms. Fuel cost optimization response of KHA is also better than other algorithms in studies. Simulations of implemented algorithm for different test systems are obtained by MATLAB. Inclusion of different real time constraints involved in ELD problems makes this implementation an effective and reliable factor in practical field.

Chapter 1

Introduction

1.1 Inspiration and Objectives

In present era, concept of living is impossible without electric power and energy as a huge amount of energy and power is being utilized in the production and utilization of goods around which our life is completely surrounded. Power and energy systems fulfill our requirement of electricity to run the appliances and goods of our need. Power systems are consisting of various number of power generating units attached to them to make a whole system. It is highly desired to get the continuous supply of electric power in a cost effective and efficient way. One of the most important achievements of human beings ever is the establishment of electric power systems. The most important phases of an electric power system are Generation, Transmission, and Distribution of electric power.