Economic Dispatch with Multiple Fuel Options using Water Evaporation Optimization

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Abstract

This paper presents Water Evaporation Optimization (WEO) algorithm for solving Economic Dispatch (ED) problem with multiple fuel options. The objective of the problem is to identify the most economical fuel for each generating unit in order to minimize the total fuel cost while satisfying system constraints. The valve point loading effects should also be considered to obtain a realistic and more accurate ED solution. The proposed WEO algorithm is based on the evaporation of a tiny amount of water molecules on the solid surfaces with different wettability which can be studied by molecular dynamics simulations. The proposed algorithm is implemented and tested on ten generating unit test system. The obtained results have shown that the proposed method is efficient for solving ED problem with multiple fuel options and favorable for implementation in large scale problems.

References


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Index Terms

Computer Science Algorithms

Keywords

Economic Load Dispatch, Multiple Fuel Options, Piecewise Quadratic Cost Function, Water Evaporation Optimization, Valve Point Loading Effects.