Economic Dispatch with Discontinuous Fuel Cost Function by A Hybrid Method

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Abstract—Economic dispatch with discontinuous cost functions is one of the main functions of power generation operation and control. Two major non-smooth fuel cost functions of units are; units with piecewise quadratic fuel cost functions and fuel cost functions with operating prohibited zones. An electrical power system must be operated most economically while stays within its security limits. This paper develops a hybrid evolutionary programming, Tabu search and direct compensation algorithm to solve the discontinuous economic dispatch (DED) problem. Effectiveness of the new algorithm is demonstrated on three example systems and compared to that of genetic algorithms, evolutionary programming (EP) and hybrid EP, Tabu search and quadratic programming. Numerical results illustrate that the proposed method can provide accurate solutions with reasonable performance.

Index Terms—Discontinuous cost functions, evolutionary programming, Tabu search.

VI. REFERENCES


VII. BIOGRAPHIES

Sun-Nien Yu was born on April 1966 in Miaoli, Taiwan. He received his B. S. and M. S. degrees in Electric Engineering from National Taiwan Institute of Technology in 1991 and 1993 respectively, and Ph. D. from Department of Electrical Engineering, National Taiwan University of Science and Technology in 2004. His research interests are in the operation, planning and analysis of power systems. Since 1996, he has been with Chung Chou Institute of Technology.