

{tag}

{/tag}

IJCA Proceedings on International Conference
on Innovations In Intelligent Instrumentation, Optimization and Electrical Sciences

© 2013 by IJCA Journal

ICIIOES - Number 2

Year of Publication: 2013

Authors:

N. M. Ramya

M. Ramesh Babu

T. D. Sudhakar

{bibtex}iciioes1392.bib{/bibtex}

Abstract

The main objective of the Economic Dispatch (ED) problem is to find optimal allocation of output power among the various generators available to serve the system load. It is necessary to incorporate wind and pumped storage plants in classical economic dispatch problem due to the increase in the use of renewable energy sources. The cost of power generation will be considerably reduced due to the renewable energy resources. This paper

proposes a Stochastic Economic Dispatch (SED) model incorporating wind and pumped storage generators in addition with the thermal generators. Premature convergence and high computation time are the main drawbacks of the traditional PSO algorithm to solve the optimization problems. In this work a Modified PSO (MPSO) algorithm is proposed to remove the drawbacks of the traditional PSO to solve the proposed SED problem.

Refer

ences

- J. J. Grainger and W. D. Stevenson, Jr. , Power System Analysis. New York: McGraw-Hill, 1994.
- A. J. Wood and B. F. Wollenberg, Power Generation, Operation and Control, 2nd ed. New York: Wiley, 1996.
- Bart C. Ummels, Madeleine Gibescu, Engbert Pelgrum, Wil L. Kling, and Arno J. Brand, "Impacts of Wind Power on Thermal Generation Unit Commitment and Dispatch", IEEE Transactions on Power Systems , vol. 22, no. 1, pp. 44-51 March. 2007.
- M . R. Patel, Wind and Solar Power Systems. Boca Raton, FL: CRC Press, 1999
- M. A. Abido, "Multiobjective Evolutionary Algorithms for Electric power dispatch problem", IEEE Transactions on Evolutionary computation. ,vol. 10. ,no. 3. ,June 2006.
- I. G. Damousis, M. C. Alexiadis, J. B. Theocharis, and P. S. Dokopoulos, "A fuzzy model for wind speed prediction and power generation in wind parks using spatial correlation," IEEE Transaction on Energy Conversion. , vol. 19, no. 2, pp. 352–3361, Jun. 2004.
- S. Li, D. C. Wunsch, E. A. O'Hair, and M. G. Giesselmann, "Using neural networks to estimate wind turbine power generation," IEEE Transactions on Energy Conversion. , vol. 16, no. 3, pp. 276–282, Sep. 2001.
- V. Miranda and P. S. Hang, "Economic dispatch model with fuzzy wind constraints and attitudes of dispatchers," IEEE Transactions on Power Systems. , vol. 20,no. 4, pp. 2143–2145, Nov. 2005
- S. Roy, "Market constrained optimal planning for wind energy conversion systems over multiple installation sites," IEEE Transactions on Energy Conversion. , vol. 17, no. 1, pp. 124–129, Mar. 2002
- Wu Jiekang, Zhu Jianquan, Chen Guotong, and Zhang Hongliang, "A Hybrid Method for Optimal Scheduling of Short-Term Electric Power Generation of Cascaded Hydroelectric Plants Based on Particle Swarm Optimization and Chance-Constrained Programming", IEEE Transactions on Power Systems , vol. 23, no. 4, November 2008
- N. Sinha, R. Chakrabarti, and P. K. Chattopadhyay,"Evolutionary Programming Techniques for Economic Load Dispatch",IEEE Transactions on evolutionary computation, Vol. 7, No. 1, February 2003.
- Ioannis G. Damousis , Anastasios G. Bakirtzis and Petros S. Dokopoulos,"Network-Constrained Economic Dispatch Using Real-Coded Genetic Algorithm", IEEE Transactions on power systems,Vol. 18,No. 1,February 2003.
- J. B. Park,, Ki-Song Lee, J. R. Shin, and K. Y. Lee,"A Particle Swarm Optimization for Economic Dispatch With Nonsmooth Cost Functions", IEEE Transactions on power

systems, Vol. 20, No. 1, February 2005.

- T. Aruldoss Albert Victoire, and A. Ebenezer Jeyakumar, "Reserve Constrained Dynamic Dispatch of Units With Valve-Point Effects", IEEE Transactions on Power Systems. , vol. 20, no. 3, pp. 1273-1282, August. 2005.
- Derong Liu, and Ying Cai, "Taguchi Method for Solving the Economic Dispatch Problem With Nonsmooth Cost Functions", IEEE Transactions on power systems, Vol-20, No. 4, November 2005.
- Pichet Sriyanyong, "Solving Economic Dispatch Using Particle Swarm Optimization Combined with Gaussian Mutation" at Proceedings of ECTI-CON 2008, pp. 885-888.
- A. I. Selvakumar and K. Thanushkodi, "A new particle swarm optimization solution to nonconvex economic dispatch problems," IEEE Transactions on Power Systems. , Vol. 22, no. 1, pp. 42–51, Feb. 2007.
- C. L Chen, "Simulated annealing-based optimal wind-thermal coordination scheduling," IET Gen. , Transactions on Distribution. , vol. 1, no. 3, pp. 447–455, May 2007.
- Ruiwei Jiang, Jianhui Wang, and Yongpei Guan, "Robust Unit Commitment With Wind Power and Pumped Storage Hydro", IEEE Transactions on Power Systems. , vol. 27, no. 2, pp. 800-810, May. 2012.

Index Terms

Computer Science

Network Application

Keywords

Stochastic Economic Dispatch Wind Generators Pumped Storage Plants Modified Particle Swarm Optimization.