AGC Tuning Of Interconnected Reheat Thermal Systems With Particle Swarm Optimization

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Summary

This paper demonstrates the use of particle swarm optimization for optimizing the parameters of automatic generation control systems (AGC). An integral controller and a proportional-plus-integral controller are considered. A two-area reheat thermal system is considered to exemplify the optimum parameter search. The optimal AGC parameters search is formulated as an optimization problem with a standard infinite time quadratic objective function. A time domain simulation of the system is then used in conjunction with the particle swarm optimizer to determine the controller gains. The integral square of the error and the integral of time-multiplied absolute value of the error performances indices are considered. The results reported in this paper demonstrate the effectiveness of the particle swarm optimizer in the tuning of the AGC parameters. The enhancement in the dynamic response of the power system is verified through simulation results.

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