Abstract

Deregulated power system with multiple varieties of generations is the order of the day. In a power system, load varies continuously therefore frequency changes continuously. Automatic Generation Control (AGC) is used in the power system for balancing the generation and demand and control the changes in tie-line powers within the allowable limits by maintaining rated frequency. Solar power is nowadays very popular renewable energy in India and world. Many power deficit states in India have become power surplus states using it along with conventional thermal power. Benefits of deregulation such as improved efficiency, customer friendly services and lower prices for consumers are well known. Accordingly a two-area deregulated system is considered for investigation of AGC. Primary controllers like governors will not eliminate steady state errors which may not satisfy the constraints of power system. For better AGC responses, different secondary controllers like Integral, PID, PI-PD controllers are used for a two area deregulated power system consisting of reheat thermal, solar thermal and solar photovoltaic units. Here Integral, PID and PI-PD controllers are tuned by Particle Swarm Optimization (PSO) approach. The resulting deregulated power system is simulated and
analyzed using MATLAB Simulink software to propose a good secondary controller.

References


Index Terms

Computer Science Circuits and Systems
Keywords

Automatic generation control, Particle swarm optimization, Frequency error, Multi area power system, PID controller, PI-PD controller, Tie line power deviation.