Abstract

Optimal power flow (OPF) is one of the most vital tools for power system operation analysis, which require complex mathematical formulation to find best solution. Particle swarm optimization is one among many methods for solving nonlinear optimization problems and it one of the swarm intelligences. Optimal power flow is one of nonlinear constrained and occasionally combinatorial optimization problems of power system. The objective of an optimal power flow is to find steady state operation point which minimizes generation cost, load, and ability. The OPF solution includes an objective function. A common objective function concerns the active power generation cost. A particle swarm optimization (PSO) is proposed to solve OPF problem. After solving OPF problem the results of PSO would be compared by using many methods such as linear programming, genetic algorithm. The proposed PSO is verified by IEEE-30 in all case studies PSO shown to achieve a lower cost and losses than it when there is line outage and generator outage.

Conventional load flow is used to perform the equality constraints. A computer program, written
Optimal Power Flow for a Power System under Particle Swarm Optimization (PSO) based in MATLAB environment, is developed to represent the proposed method.

References


Index Terms

Computer Science

Power Systems

Keywords

Optimal power flow, particle swarm optimization, economic dispatch