

OPTIMAL POWER FLOW USING IMPROVED PARTICLE SWARM OPTIMIZATION FOR EVALUATION OF WHEELING AND NON-UTILITY GENERATION (NUG) RELATED OPTIONS

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ABSTRACT

This paper presents application of Optimal Power Flow (OPF) using Improved Particle Swarm Optimization (IPSO) for the evaluation of wheeling options. An efficient OPF algorithm has been proposed to determine the optimal selection based on wheeling cost. Based on the power transfer capability and minimum generation cost, an optimal wheeling option will be suggested to both the owners of private Non-Utility Generator (NUG) and the utility. In the proposed IPSO method, a new velocity strategy equation is formulated suitable for any number of systems and the Constriction Factor Approach (CFA) utilizes the eigen value analysis and controls the system behaviour so that the system does not diverge in a real value region and finally converge, the system can search different regions efficiently. The CFA generates higher quality solutions than the conventional PSO approach. The proposed algorithm is independent of the cost characteristics of Non-Utility Generators (NUG). The proposed model has been tested on the IEEE-30 bus system with synthetic imposition of wheeling transactions. The solutions obtained, are quite encouraging and useful in the present deregulated environment.