

Abstract

A metaheuristic ant colony system (ACS) combined with the universal Ushakov's technique for reliability optimization design problem of multi-state series-parallel power system is proposed. The ACS uses the universal Ushakov's technique to evaluate the different reliability (availability) indices of the system, where the ant searches for the best reliable machines. The machines are characterized by their cost, performance and reliability. A case study is presented and an implementation of the optimization approach is carried out using MATLAB software. The obtained results show that the presented approach is adequate for solving the reliability optimization design problem of power systems especially at the initial design stages