Abstract

Multi-objective optimisation is a proven well known parameter tuning technique in complex power system problems. It is especially suited to solve complex transmission network expansion planning. This paper proposes a practical method for transmission network expansion planning by bacterial foraging technique. The electricity industry has always been interested in expanding investment in the transmission sector of the industry. As load demand increases and generation expands to meet the need, transmission expansion becomes important in order to increase social welfare by reducing total system operating cost, and to make the system more reliable. In this context, two objectives: investment cost and network adequacy restrictions are considered to overcome the drawbacks of conventional mathematical optimization method in arriving at local optimum and dimension disasters, we introduced the bacterial foraging technique into transmission network optimal planning for the first time, from
which the optimal scheme is generated. The bacterial foraging is used as the optimization tool
to obtain the Pareto approximation set solutions. The proposed algorithm is implemented on
typical IEEE 6 bus systems and performance is assessed by statistical test.

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**Index Terms**

Computer Science  \[\text{Power Systems}\]

**Key words**

TNEP  \[\text{multi-objective optimization (MOP)}\]  \[\text{network}\]

adequacy restrictions

operational cost

bacterial foraging