Abstract

Network reconfiguration aims to minimize network real power loss through rearranging the status of open switches. The consumers of the distribution networks need a better voltage profile for efficient operation of various gadgets. This paper thus attempts to develop a new reconfiguration algorithm with an objective of improving the voltage profile of the distribution network without incurring any additional cost for installation of capacitors and tap-changing transformers. The algorithm uses a nature-inspired biogeography based optimization (BBO) that searches for optimal solution through the migration and mutation operators. Test results on a 33 and 69-node distribution networks reveal the superiority of the developed method.

References


18. S.Rajasomashekar and P Aravindhababu. (2012). Biogeography-based optimization technique for best compromise solution of economic emission dispatch, Swarm and
Evolutionary Computations, dx.doi.org/10.1016/j.swevo.2012.06.001.


Index Terms

Computer Science  Wireless

Keywords

radial distribution networks, network reconfiguration, biogeography based optimization.

Nomenclature BBO — biogeography based optimization branch-to-node matrix that describes the topological structure of the distribution network GA — genetic algorithm habitat suitability index habitat — vector of load currents vector of branch currents equivalent load current at node- maximum number of iterations for convergence check number of nodes number of branches number of elite habitats PSO — particle swarm optimization habitat modification probability mutation probability real and reactive power load at node- resistance and reactance of branch- maximum species count suitability index variable binary variable that represents the topological status of -th branch. It equals ‘1’, if the tie/sectionalizing switch is closed, else its value is set.