Reliability Enhancement and Loss Reduction in Radial Distribution System by Reconfiguration using BFA

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Authors:
E. R. Biju

Abstract

This paper presents a new methodology to solve radial distribution system (RDS) reconfiguration problem to reduce the losses and to enhance the reliability of the system. Optimal reconfiguration selects the best set of feeders by changing the switching status of sectionalizing and tie switches so that the resulting RDS has improved voltage profile and minimum power loss. In addition, the impact of DG and capacitor are also considered in the problem formulation. Also in order to calculate the reliability indices such as SAIFI, SAIDI, CAIDI, AENS and ASAI, the reconfiguration technique is considered as a failure rate reduction strategy. This paper presents the application of bacterial foraging algorithm (BFA) to solve optimal network reconfiguration problem. A standard IEEE 69 bus radial system is chosen for the study. To show the effectiveness of the proposed algorithm in finding the best solution, simulations are carried out on the test system and the results are briefly compared before and after reconfiguration.

References


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Index Terms

Computer Science Distributed Systems

Keywords

Distributed generator, Reconfiguration, Reliability indices, Bacterial foraging algorithm, Radial distribution system.