Abstract

Nowadays, it is rare for a power distribution system to run without a unique protective device to handle transients produced by energy theft, lightning, falling trees, and animals such as monkeys, among other things. Researchers employing reclosers to regulate transients have previously examined reliability needs. Non-technical power loss and cost reduction, on the other hand, have not been adequately addressed in order to improve high-quality power supply. As a result, customers have always had to pay extra for system losses. This thesis discusses optimal reclosing, cost of energy not served, and the firefly algorithm strategy to combat this threat. In the event of temporary faults, reclosers are employed to temporarily or permanently lock out the distribution system, preventing damage to system apparatus. The distribution system successfully functions on computerized intelligent settings, based on predefined transient faults in high-risk locations, with appropriate reclosing. Recloser's accurate reactions in diverse situations are intelligently determined. This thesis built an intelligent system that uses the firefly algorithm to install reclosers at specific points along distribution lines, as well as manage and monitor transient faults. As a result, utilizing the optimal reclosing technique, energy not served (ENS) and associated costs are minimized. The results and analysis of the used method show a cost reduction of sixty-one (61%) on energy not served (ENS) during transient. This saving is made feasible by the recloser's optimal placement and reaction time. Other than the Firefly algorithm, the radial distribution system used to assess this can be replaced with a closed network and another new optimization method.