Fault diagnosis on electrical distribution systems based on fuzzy logic

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Abstract

The occurrence of faults in distribution systems has a negative impact on society, and their effects can be reduced by fast and accurate diagnostic systems that allow to identify, locate, and correct the failures. Since the 1990s, fuzzy logic and other artificial intelligence techniques have been implemented to identify faults in distribution systems. The main objective of this paper is to perform fault diagnoses based on fuzzy logic. For conducting the study, the IEEE 34-Node Radial Test Feeder is used. The data was obtained from ATPDraw-based fault simulation on different nodes of the circuit considering three different fault resistance values of 0, 5, and 10 ohms. The fuzzy rules to identify the type of fault are defined using the magnitudes of the phase and neutral currents. All measurements are taken at the substation, and the results show that the proposed technique can perfectly identify and locate the type of failure.

Keywords

Distribution systems, Fault location, Fault type, Fuzzy logic