

Analysis of Fault Recovery Process in Distribution Networks with the Integration of Soft Open Point

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Abstract

After a fault occurs in the distribution network, the real-time balance between power supply and load demand must be met. Load can be restored through upper sources and the nearby power supply of distributed generators. Therefore, it is necessary to construct the power transmission path between each node, namely transmission matrix. Furthermore, the access of new controllable devices such as soft open point (SOP) makes it possible for power supply quickly by providing a path for power loss loads. In this paper, a fault recovery model of distribution network considering SOP is established. The dynamic balance of node power is firstly considered, then the the impact mechanism of SOP on fault recovery is elaborated. The cone relaxation process and the objective function of fault recovery is further introduced. Through the simulation analysis of the modified IEEE 33-node test system, scenarios of single fault and multi-point fault are built. The effectiveness of the proposed method and the improvement of load recovery after fault by SOP are verified.

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