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基于电压跌落状态估计的复杂配电网络故障路径搜索算法

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摘要
基于电压跌落状态估计，提出了适用于复杂配电网络的故障路径搜索算法。对于辐射状配电网络，该搜索算法以分界点为搜索节点，以馈线段为搜索半径，以馈线段平均残压值为搜索目标，搜索速度大大加快，抗噪声能力较强。对故障路径末端馈线段的逐点搜索也有效地解决了合理确定故障点的问题。单机和双机辐射状网络的算例分析结果表明了该算法的正确性、有效性和快速性。

关键词 配电系统；电压跌落；状态估计；故障路径搜索

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A Fault Path Searching Algorithm Based on Voltage Sag State Estimation for Complicated Distribution Systems

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Abstract
Measured values of on-site voltages are often polluted by noises, and fault path is not single in complicated distribution systems, such as multiple-source and loop network. Hence traditional fault path search algorithm detecting the voltage magnitudes dropping is challenged. On the basis of voltage sag state estimation, a fault path searching algorithm suitable to complicated distribution systems is proposed. As for radial distribution networks, in this searching algorithm the boundary points is taken as searching nodes, the feeder section as search radius and the average residual voltage of feeder section as search object, thus the search speed can be evidently quickened and the ability of anti-noise can be enhanced. The point-by-point search for the feeder section at the end of the fault path can effectively solve the problem of rationally locating fault point. Case simulation results of both single machine and two machine radial network show that the proposed algorithm is correct, effective and speedy.

Key words distribution system；voltage sags；state estimation；fault path search

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