

Impact of energization current on the safe design of distribution substation earth grid

ABSTRACT

Energization current is a fundamental consideration in designing of distribution substation earth grid. Arbitrary choice of energization current in earth grid design process may lead to technical and economic implications resulting in underestimated or overestimated designs. In this paper, a distribution substation earth grid was designed using SESCAD and executed in MALT module of CDEGS. The energization current was varied by 100, 75, 50 and 25% of the short circuit current available at the secondary terminals of the upstream transformer to determine the impact on safety criteria of the earth grid. Results indicated that, the EPR for 100% fault current was higher, whereas the step and touch voltages were lower. Also, compared to the other cases of short circuit currents, there was no difference in step and touch voltages when the energization currents were varied at 75, 50 and 25%.

Keyword: Energization current; Safety criteria; Distribution substation; CDEGS