

ABSTRACT:

A wooden pole is the most popular choice as the physical support structure for an electrical distribution network. A recent increase in the failures of wooden poles that lead to pole fires warrant further investigation into the performance of wooden poles and pole design. This paper examines the leakage current distributions on the radial, heartwood and sapwood section of the wood pole and the effect of the metal insertion in wooden structures using an electrical ladder network model. This paper presents the findings from two wooden pole models: a basic wooden pole and a complete wooden pole with cross-arm and supporting bars attached. The results show that the bulk of the leakage current flows through the internal section under wet weather conditions and the metal insertion along the radial of the wood increase the magnitude of the leakage current. The model takes into consideration the pole dimension, rain parameter, moisture content, air resistance, and preservative effect (chromated copper arsenate) on the wooden pole.