

A Method for the evaluation of the behavior of a 15 kV insulator under bipolar oscillating impulse voltages.

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ABSTRACT

Lightning overvoltages are affected by many parameters and may differ substantially from the standard lightning impulse waveshape. Voltages induced on overhead power distribution lines by lightning flashes terminating on a point in their vicinity not rarely exhibit bipolar characteristic. In this paper the behavior of a typical 15 kV pin-type porcelain insulator subjected to bipolar oscillating impulses representative of lightning-induced voltages is investigated. It is shown that the method proposed by Savadamuthu et al. to estimate the insulation strength of small insulation systems subjected to bipolar oscillating voltages is not able to predict any of the flashovers observed on the insulator. However, a simple but effective modification of the method to estimate the three basic parameters of the model results in a better criterion to evaluate whether a semi-cycle contributes to the flashover process and leads to a significant improvement in the rate of success of the procedure in predicting the occurrence of flashovers.