

Evaluation of Currents and Charges in Low-voltage Surge Arresters due to Lightning Strikes

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Abstract-- This paper presents an evaluation of the values of currents and charges absorbed by surge protective devices (SPDs) connected in low-voltage open-wire overhead distribution networks in the case of direct lightning strikes to primary lines. Also, some information about overvoltages magnitude is included. The calculations have been performed using the ATP (Alternative Transients Program). The modeling of the system components includes the insulation characteristics (voltage versus time to breakdown) of the primary and secondary insulators and a distribution transformer model for high frequencies which takes into account the load conditions. Some parameters of interest are taken into consideration in the analysis, such as ground resistances of poles and consumers, lightning strike position and crest value of the stroke current.
Index Term,?--arresters, lightning, power distribution, power distribution lines, power system transients, surge protection.

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