

Analysis of the Dielectric Behavior of Distribution Insulators Under Non-Standard Lightning Impulses Voltages

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Overhead distribution lines are often exposed to lightning overvoltages, whose waveforms vary widely and can differ substantially from the standard impulse voltage waveform (1,2 - 50). Different models have been proposed for predicting the strength of insulation subjected to impulses of non-standard waveforms. One of the most commonly used is the "disruptive effect model", but there are different methods for estimating the parameters needed for its application. This paper aims at evaluating the dielectric behavior of medium voltage insulators subjected to impulses of non-standard waveforms, as well as at evaluating two methods for predicting their dielectric strength against such impulses. The test results relative to the critical lightning impulse flashover voltage (U_{50}) and the volt-time characteristics obtained for the positive and negative polarities of different voltage waveforms are presented and discussed.