

**LIGHTNING OVERVOLTAGES CAUSED BY DIRECT STRIKES TO
DISTRIBUTION LINES**

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Direct strikes to medium-voltage (MV) distribution lines cause surges of very high magnitudes in the primary circuit which travel along the line provoking flashovers across insulators and the operation of surge arresters. Surges are also transferred to the secondary through the distribution transformers. In some circumstances, depending on the values of the line and lightning parameters, the overvoltage magnitudes at the low-voltage (LV) transformer terminals can also reach values above the lightning impulse withstand capability of the LV side, causing equipment failures and power supply interruptions.

This paper aims at evaluating the behavior of lightning surges at both MV and LV circuits in the case of direct lightning strikes on a three-phase urban distribution network and discuss how they are affected by the stroke current magnitude and waveform, ground resistance, and soil resistivity.