

LIGHTNING INDUCED VOLTAGES ON LOW-VOLTAGE LINES WITH DIFFERENT CONFIGURATIONS

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ABSTRACT

Lightning overvoltages originated both on the primary and secondary circuits can lead to distribution transformer failures and to damages to the customer's sensitive electronic equipment as well. In view of the possibility that an important part of such problems may be associated with the so-called low-side surge phenomena, this paper analyses the characteristics of lightning induced overvoltages on secondary networks. The calculations are performed through the use of the "Extended Rusck Model" (ERM) and the surges are evaluated considering different topologies for the low-voltage network. The high frequency behaviors of loads and distribution transformer are taken into account and the influences of parameters such as the stroke current front time and the ground resistance are investigated, as well as the effect of the presence of surge protective devices at different points of the low-voltage line.