A Proposal for the Prediction of the Volt-Time Curves of MV Insulators Based on the Disruptive Effect Model

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This paper presents a novel method to estimate the parameters of the Disruptive Effect Model for the prediction of the volt-time curves of medium voltage (MV) insulators. Two non-standard impulse voltage waveshapes, of both polarities, were adopted in the tests, namely 1.2 / 10 μs and 7.5 / 30 μs. The measured volt-time characteristics of a 15 kV class pin-type insulator were compared with those predicted by four different procedures related to the Disruptive Effect Model: Darveniza and Vlastos; Hileman; Ancajima et al., and the one proposed in this paper. The results show that the methods by Darveniza and Vlastos and by Hileman do not predict insulator breakdown for the lower peak voltage levels of the 1.2/10 μs waveshape of both polarities. On the other hand, a relative good agreement is found between theoretical and experimental results for the calculations performed using the method proposed in this paper and the one by Ancajima et al.