

Flashover Voltage of Silicone Insulating Surface Covered by Water Drops under AC Voltage

Authors : Fatiha Aouabed, Abdelhafid Bayadi, Rabah Boudissa

Abstract : Nowadays, silicone rubber insulation materials are widely used in high voltage outdoor insulation systems as they can combat pollution flashover problems. The difference in pollution flashover performance of silicone rubber and other insulating materials is due to the way that water wets their surfaces. It resides as discrete drops on silicone rubber, and the mechanism of flashover is due to the breakdown of the air between the water drops and the distortion of these drops in the direction of the electric field which brings the insulation to degradation and failure. The main objective of this work is to quantify the effect of different types of water drops arrangements, their position and dry bands width on the flashover voltage of the silicone insulating surface with non-uniform electric field systems. The tests were carried out on a rectangular sample under AC voltage. A rod-rod electrode system is used. The findings of this work indicate that the performance of the samples decreases with the presence of water drops on their surfaces. Further, these experimental findings show that there is a limiting number of rows from which the flashover voltage of the insulation is minimal and constant. This minimum is a function of the distance between two successive rows. Finally, it is concluded that the system withstand voltage increases when the row of droplets on the electrode axis is removed.

Keywords : contamination, flashover, testing, silicone rubber insulators, surface wettability, water droplets

Conference Title : ICEEE 2014 : International Conference on Electrical and Electronics Engineering

Conference Location : Paris, France

Conference Dates : August 28-29, 2014