

Considering the effects of a cross-arm on a contaminated polymer insulator at different angles

ABSTRACT

This paper considers the effects of a cross-arm on a contaminated polymer insulator at different angles (90° , 60° and 45°) with negative and positive impulses. An experiment was conducted using a 10 kV polymer insulator that was contaminated with 4 % salt (a mixture of distilled water and sodium chloride). From the experiment, the behaviour of the voltage breakdown and leakage current of the contaminated insulator positioned at different angles from the cross-arm was evaluated under different impulse polarities. The results show that the values of the breakdown voltage and leakage current decrease with angle when using the 90° angle as a reference. The reason for this study into the effects of the cross-arm on a contaminated polymer insulator is because in the real case, when the insulators are installed on an angle tower, the forces or tensions due to the weather conditions (especially under strong winds) and from the distribution lines themselves will force the installed insulators to be tilted from its original 90° angle position.

Keyword: Breakdown voltage; Contaminated polymer insulator; Impulse voltage