

Investigation of the Effect of Impulse Voltage to Flashover by Using Water Jet

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Abstract : The main function of the insulators used in high voltage (HV) transmission lines is to insulate the energized conductor from the pole and hence from the ground. However, when the insulators fail to perform this insulation function due to various effects, failures occur. The deterioration of the insulation results either from breakdown or surface flashover. The surface flashover is caused by the layer of pollution that forms conductivity on the surface of the insulator, such as salt, carbonaceous compounds, rain, moisture, fog, dew, industrial pollution and desert dust. The source of the majority of failures and interruptions in HV lines is surface flashover. This threatens the continuity of supply and causes significant economic losses. Pollution flashover in HV insulators is still a serious problem that has not been fully resolved. In this study, a water jet test system has been established in order to investigate the behavior of insulators under dirty conditions and to determine their flashover performance. Flashover behavior of the insulators is examined by applying impulse voltages in the test system. This study aims to investigate the insulator behaviour under high impulse voltages. For this purpose, a water jet test system was installed and experimental results were obtained over a real system and analyzed. By using the water jet test system instead of the actual insulator, the damage to the insulator as a result of the flashover that would occur under impulse voltage was prevented. The results of the test system performed an important role in determining the insulator behavior and provided predictability.

Keywords : insulator, pollution flashover, high impulse voltage, water jet model

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