

Effect of Salt Content and Water Droplet on Partial Discharge Occurred in Artificially Packed Snow Formed over a 66kV Insulator

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Partial discharge occurred in an artificially formed capped snow over a 66 kV long-rod insulator was investigated experimentally in two winter seasons of 2007/08 and 2008/09. Tested insulators were polymer and porcelain. The insulating property of snow gradually varies with time after application of ac voltage and leakage current flowing through the capped snow was increased. Since snow melting in capped snow forms small air gaps, partial arc discharge occurs at the air gaps and/or the surface of the insulator. Sample snow was polluted by NaCl and MgCl₂ and the value of conductivity of melt water from snow was set at 300 μ S/cm. Partial discharge was detected by a UV-rays camera and waveform of leakage current. The waveform of leakage current certainly indicates occurrence of partial arc discharge as well as the insulating condition of capped snow. The leakage current with either polarity tends to flow at the final stage. This phenomenon was appeared in polymer insulator but not porcelain insulator, especially when snow was polluted by MgCl₂. Water droplet or water layer along the surface would play an important role to cause uni-polar partial arc discharge along the surface of polymer insulator covered with snow.