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Effects of Algae on the Flashover Performance of Insulators Covered with RTV-Coating

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In the humid areas like Sichuan Province of southern China, algae often grows abundantly on the surface of porcelain insulators covered with room temperature vulcanized silicone rubber (RTV), which may increase the risk of pollution flashover. In order to solve the potential threat to the safety of power grid, study on the growth conditions, the species, the growth habit and the distribution status of the algae was carried out by collecting and investigating the algae pollution layer on the surface of RTV-coated insulators in various transformer substations all around Sichuan basin. Besides, the influence of algae layer on the hydrophobicity of RTV-coating was tested by water spray classification. At last, the switching impulse flashover performance and pollution flashover performance of the algae polluted insulator were tested by up and down method. The results indicate that the algae layer mainly covers the top surfaces of the insulator umbrella skirts, and the mainly type of algae is apatococcus lobatus of chlorophyta. The algae pollution layer will lead to obvious decrease of hydrophobicity and surface conductivity of the RTV-coating covered with algae pollution layer, thus the pollution flashover voltage declines significantly. However, the switching impulse flashover performance is seldom or never affected by the algae layer, the reason is the arc propagating along the tips of umbrella skirts of insulator, rather than developing along the surface of insulator during the impulse flashover process, hence the surface condition can't affect the switching impulse flashover performance of insulator. The research about the influence of algae pollution layer on the insulation performance of RTV-coated insulator provided a reference for the operational maintenance of composite insulation.

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