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Analysis of frequency characteristics of electrical arcs on the insulating sheath of the ADSS fiber optic cables

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Abstract: The insulating outer-sheath of ADSS (All dielectric self supporting) cables used on high voltage transmission lines are often subjected to various environmental effects. The ageing process of cable sheath can be investigated by using the dry-band arcing test method under laboratory conditions. Dry-band arcing is the most common technique to determine the ageing period of insulating materials. Environmental effects such as rain, humidity, dew and ice produce various amounts of wet regions on the cable surface. Electrical arcs and hence degradations are occurred on the cable surface due to the enhanced electrical field with formation of wet regions. In this study, the ageing process of ADSS cables was investigated by using the dry band arcing test method (IEEE 1222 Electrical surface degradation). Rainfall intensity determines the wet regions on the cable surface which affects the ageing process of the cable. During tests electrical arc signals were investigated by analyzing wet region scope versus amplitude and frequency spectrum variations via the FFT method. It is possible to claim that the proposed FFT analysis clearly identifies the ageing period of the ADSS cable which was subjected to different rainfall intensities by monitoring frequency spectrum of the arc signals.

Key Words: ADSS cable, dry-band arcing, frequency spectrum, ageing process

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