

INVESTIGATION OF AGING TEST METHODS ON ADSS CABLES

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ABSTRACT

All dielectric self-supporting (ADSS) fiber optic cables have been installed in power transmission lines. As time passed, ADSS cable failures started to occur since ADSS cables, placed under transmission lines, have been subjected to a high electrical field. Dry band arcing is one of the electrical phenomena that causes most of these failures and it is a common problem in industry. In order to investigate the reasons of cable failures, several studies have been carried out and a new testing method was developed for the IEEE 1222 standard. This new method simulates the actual field conditions for ADSS cables, and at the same time, it determines the dry band arcing resistance. Rather than defining the insulation strength of the cable, the IEEE 1222 method decides the quality of the cable insulation material. In this study; two different dry band arcing test method is used to investigate the surface behavior of ADSS cables. At first cables were tested according to IEEE 1222 test standart then at the same laboratory conditions, ADSS cable samples studied for the first time under the sag conditions. The results taken from the experimental work were studied with weibull statistics. The reliability, unreliability failure rate and probability density functions (pdf), variations acquired and discussed for two different test set up. The statistical comparison gives us that the aging behavior of the ADSS cables is the same under different experimental conditions. ADSS optical cables have so far shown an acceptable performance on lines up to 150 kV. Nonetheless, failures have occurred with ADSS cables installed on lines with a higher voltage. These failures are caused by electrical phenomena, such as corona, sparking and dry band arcing, since the cables are exposed to the strong electrical field environment. The basic concept of the arc resistance test is that the energized cable is sprayed by salt water for few minutes. This produces conducting wet layer on the cable surface and initiate leakage current.