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The Study of Evaluation for Deterioration of Generator Coil Insulation by High-Voltage A. C. Method

Shinkei Ō*

In the evaluation of generator coil insulation, it is very valuable and important to measure each non-destructive insulation characteristics, and decide the deterioration of coil insulation or presume the breakdown voltage from the different testing methods.

Now, there are some non-destructive tests for generator coils by high-voltage A. C. method, for example, $\tan \delta$ test, A. C. current test and corona test, but it is inconvenient that now there are no accurate standards for deciding deterioration of insulation.

Recently, the deterioration by corona discharge has been a matter of great concern, but no quantitative information has been made available so far as to the degree of corona that is injurious. So, the corona test will be able to supply the available information to the evaluation of insulation by finding the change of insulation characteristics.

On the one hand, in Japan, it has succeeded to develop the method to presume the A. C. breakdown voltage from the Second Current Rapid Increase Point in A. C. current-voltage characteristic about 3 years ago.

In order to study the evaluation of generator coil insulation, 8 coils were applied to the corona test, $\tan \delta$ test and A. C. current test. From these tests, the consideration and discussion were tried, about the nondestructive insulation characteristics or correlation between the nondestructive insulation characteristics and breakdown voltage, and also it has been made to presume the void content and A. C. short-time breakdown voltage.

From the results of these tests, though it will not be able to find the quantitative correlation between tests, in the qualitative connection we can expect the available results.

Further from these results, the evaluation of insulation deterioration in each test was generally accurate, and also presuming the void content will become a standard of comparison under some assumptions.

Especially, we can find the correlation between the Second Current Rapid Increase Point and A. C. short-time breakdown voltage, then also we may find and prove that the presuming of the breakdown voltage be available and hopeful.

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Finally from the view-point of preventing accident in advance and of attaining reasonable appraisal of the apparatus under service, it is necessary to establish the standard for deciding deterioration of insulation.