

APPRECIATIONS CONCERNING THE EVALUATION OF THERMIC DEGRADATION OF ELECTRICAL TRANSFORMERS

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Keywords: transformers, isolation, solicitations, properties

EXTENDED ABSTRACT

Within normal exploiting conditions, the transformer is subjected to a certain amount of solicitations that influence the transformer as time passes. Of all these solicitations, the ones that affect the isolation mostly are internal over tensions, caused by the changes of the parameters of the electro energetic system as well as external ones (climate), caused by lightning strikes, that is the temperature of the isolation – paper-oil – from the transformer. Because of all different factors, in the process of exploitation, the properties of the electro – isolating materials deteriorate, making them get older.

Within normal exploiting conditions, the isolation is electrically solicited (by the nominal tensions and by tensions), mechanically (because of the efforts caused by short circuits), chemically (because of sediments or chemical agents) as well as thermically (because of the temperature alterations and the environment factors).

So, the lifetime of a transformer is influenced by a variety of factors that cause alterations of the physical, electrical, mechanical, thermic or chemical properties:

The result of the alteration of the physical properties of the transformers is their ageing, therefore their life limitation. As a consequence, there have been established mathematical laws that should reflect as accurately as possible the ageing process of the transformers.

By way of experiments, for the lifetime there are laws that show the life duration of the isolations. For instance the Montsinger's law where the duration of life is expressed in Celsius degrees, the Bussing's law where the duration of life is expressed in Kelvin degrees.

To establish the evolution curves necessary when evaluating the relative thermic decay of the power electrical transformer, it's important to specify the variation areas of the particular sizes of the electro insulating material ageing from class A, where the isolation paper-oil belongs.

As an illustration, using the MathCAD medium, the case of transformers from the Bujac transforming station was taken into consideration.

So, the purpose of this paper is to present the assessment of the deterioration of the transformer. This decline takes place as soon as the transformers are recharged with variable charge, taking into consideration especially the thermic ageing of the electro insulating materials, especially those from A class.

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