

## **New technique for revitalization of power transformers installed at substations in Syrian high - voltage network**

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### **Abstract**

There are tens of power transformers working in the Syrian high voltage network with rated voltage over 11 kV. and rated power over 10 MVA. These transformers have more than 15 years in service and since then only routine maintenance was carried on for this transformers.

IEC instructions and manufacturer instructions indicate that many tests, measurements and checking have to be done for transformers .But due to the fact that measuring apparatus and testing equipment are very sophisticated and very difficult to be found at sites where power transformers are mounted, the checking and the measuring of the transformer characteristics seem to be about impossible .

It is known that due to aging , the characteristics of electrical insulation materials used in high-voltage equipment are diminished and the probability that an electrical fault to appear is more evident .

To improve the running of power transformers in high-voltage network and to reset the characteristics of the insulation materials of power transformers to their nominal values, some new techniques are used to revitalize power transformers in their site at substations without moving them to specialized repair factory or workshop.

These techniques can be classified in two methods:

First method : based on the indirect action on solid insulation of the active parts of transformer and it is called Purification / High Vacuum Technology .

Second method : based on direct action on solid insulation of the active parts of transformer and it is called Thermal High Vacuum / Oil Spray Technology .

In this paper, we develop the technology of Oil Spry High Vacuum. Using this method it can realize the following :

increase  $R_{60}$  and  $R_{15}$  for solid insulation of the transformers

reduce  $\text{tg } \alpha$  for solid insulation of the transformers.

treat ,filter and dry the oil of the transformers.

reduce  $\text{tg } \alpha$  for oil.

clean the coils.

eliminate the gas from oil and solid insulation This technique was applied on some transformers in high voltage substations at the Syrian network such as: IDLIB, DIMAS, SHEIKH KHALLOF ,FEIROUZEH and JABLEH .

The result was very good, the characteristics of the treated transformers were improved and reaches their nominal values and they were put into service in best conditions.

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For the paper in Arabic see pages (33-43)