DGA AS A KEY DIAGNOSTIC METHOD FOR OIL-FILLED EQUIPMENT UNDER OPERATING VOLTAGE

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In the last decade, the chromatographic analysis of dissolved gases (DGA) in oil has been widely used to diagnose the condition of oil-filled equipment and has shown satisfactory results. Electrical personnel and electricians are required to correctly select the oil sample and deliver it to the laboratory, and after the analysis – to correctly interpret its results and decide on the further operation of this equipment.

Oil parameters are usually evaluated in separate groups, which show its characteristics. Since different oils have different properties, it is also necessary to identify the oil used in this equipment. DGA allows track the development of processes in the equipment, identify defects at an early stage of their development that is not detected by traditional methods, determine the expected nature of the defect and the degree of damage and correctly navigate in determining the location of damage.The same types of defects can be characterized by the presence of different gases. Distributing one type of defects entails the emergence of new ones, so their timely detection and elimination will not only avoid accidents, but also extend the life of the equipment. As a rule, the analysis is carried out not for all gases, but for some of them. However, the smaller the range of gases is taken into account, the less it is possible to detect the beginning damage to the equipment in a timely manner.

There are two most common ways to extract gases from oil. In the first way, the oil sample is taken into glass syringes with a volume of 5 or 10 ml. This method is used in the case of the release of dissolved gases in the oil by vacuum. In the second way, to improve the accuracy of the results and the partial release of dissolved gases in the oil, the sample is taken into the oil sampler. However, the required volume of oil is several liters, which complicates the sampling and transportation. After the analysis, the laboratory produces only results indicating a deviation from the norm of the content of certain dissolved gases. The decision on the further operation of the equipment is taken by the electrical service.

An important advantage of DGA method is that it allows you to monitor the technical condition of the transformer. Despite these advantages of DGA, none of the methods provides complete extraction of all gases from the oil. It is bounded with the solubility factor of each gas, which must be taken into account in the final determination of the concentration.

References:

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