RECOGNITION OF THE DEFECT TYPE OF OIL-FILLED EQUIPMENT BASED ON THE ANALYSIS OF EMITTED GAS INCREMENTS

Shutenko O.
National Technical University
"Kharkiv Polytechnic Institute", Kharkiv

The international standard IEC 60599:2022 proposes to analyse the values of the differences between the concentrations of the corresponding gases obtained from the results of the last and previous tests in order to recognise the type of defect in oil-filled equipment. The idea of the proposed approach is that the amount of gas emitted at the i-th moment is the sum of the amount of gas recorded (i–1)-th moment of time and the amount of gas emitted during this time interval. If the results of the last tests predict the presence of a defect, it is obvious that the type of defect will be determined by the qualitative composition of the concentration differences of the corresponding gases. Practical implementation of this approach, performed on a verified sample, has shown the need to take into account some peculiarities. In particular, the time of defect detection does not coincide with the time of its occurrence [1, 2], as a rule, the defect occurs before it is detected. In addition, the nature of the defect may change during the development process [3, 4], and therefore it is not sufficient to analyse the results of only the last two tests, especially when it comes to combined defects. In non-sealed equipment the qualitative composition of gases in oil samples, and consequently its increments, is influenced both by the processes of gas diffusion into the atmosphere and secondary chemical reactions between oil hydrocarbons and atmospheric oxygen. The performed researches have shown that taking into account these features allows to provide high reliability of defect type recognition based on the results of analysis of the values of concentration differences of the corresponding gases.

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