

New Developments in Gas-in-Oil Analysis

Non-Draining Transformer Oil Sampling

For transformer oil monitoring, samples are taken at specially designated points of the transformer. According to IEC 60567, several litres of oil have to be allowed to drain before sampling, and the sampling bottles have to be rinsed sufficiently. While both steps are important for representative sampling, they create waste that needs to be collected. Practice shows that negligence leads to mistakes which cannot be corrected afterwards.



Fig. 1 Oil Pump Installation (OPI)



Fig. 2 Sampling by coupling with EGS and OilS

Brief description

Using a manually operated Oil Pump Installation (OPI), oil is pumped through a bypass from a lower to an upper sampling point (Fig. 1). A meter records the pump movements. When the required number is reached, the snap closing on the pressure side is loosened and the Extraction Gas Sampler EGS attached. The draining hose of the EGS is then connected with the filling neck of the OilS (Fig. 2).

When the freely flowing oil has properly filled the EGS bottle and the rinsing oil is in the aluminium bottle of the OilS, the EGS is disconnected from the pump. The OilS is now connected to the pump, de-aerated and a connection made to the upper sampling point. Further pump movements are executed until representative oil is in the aluminium bottle. Opening and closing the snap closings leads to the state before sampling. Non-draining sampling provides the following:

- | | |
|-----------------------|--|
| 250-ml EGS bottle: | - Gas-in-oil analysis, furanes, inhibitors |
| 1-l aluminium bottle: | - all other oil parameters |

Advantages

- simple retrofitting on transformers already in operation
- measuring and recording of the oil quantities rinsed before sampling
- no waste of oil or oil contamination
- proper coupling with EGS and OILS.

Automatic DGA in the Laboratory

The autosampler QH SS 24-250 is designed for large numbers of samples. Developed together with the Shimadzu company, this device uses the gas chromatographer GC 2014 for the EGS technology (Fig.1).

After perforating the cap, the autosampler is filled. Interior pressure measurement, gas sample dosing for analysis, the analysis itself and the calculation of the results are performed automatically.



Fig. 1 Autosampler / GC Coupling

N₂IS based ![®]