

POLITECHNIKA ŚLĄSKA W GLIWICACH

Wydział Elektryczny  
Katedra Optoelektroniki

ROZPRAWA DOKTORSKA

**Identyfikacja i lokalizacja sygnałów emisji akustycznej  
w olejowych transformatorach energetycznych**

mgr inż. Aneta Olszewska

Promotor: dr hab. inż. Franciszek Witos, prof. Pol. Śl.

Gliwice 2014



Title: Identification and location of acoustic emission signals within oil power transformers

Summary:

The present doctor's thesis concerns possibilities how use acoustic emission (AE) method to diagnose the state of insulation used within of oil power transformers.

This work presents problems connected with basic and advanced analysis of AE signals, recorded during investigations realized in real and working power transformers.

Specific analysis of AE signals in chosen frequency bands led to qualification of properties of AE signals coming from different sources within oil power transformers, including partial discharges (PD). This was a base for selection of a group of descriptors which enable to identify AE sources within oil power transformers. In the frame of the work the following AE sources were distinguished: noises of the measuring path, PD, phenomena connected with magnetization of ferromagnetic materials, and interferences. Moreover, the original method used to location of points where PD are generated was proposed. Such a method is based on maps of advanced descriptors (including ADC descriptor) on lateral walls of the tanks of tested transformers. Using this method, location of PD sources within tested transformers was performed. Such a location were confirm by results of other measuring methods or revisions of tested transformers.

Results of investigations carried out in the frame of the doctor's thesis can be applied in the future in diagnostic non-destructive inspections of insulation systems used within oil power transformers, realized by means of AE method.