بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

DETECTING AND LOCATING WINDING FAULTS IN POWER TRANSFORMERS

By

Mohamed Youssef Abd-Al-Glil Youssef Allam

A thesis submitted to the

Faculty of Engineering at Cairo University

In Partial Fulfillment of the

Requirements for the Degree of

MASTER OF SCIENCE

In

Electrical Power and Machines Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under supervision of

Prof. Dr. Mahmoud Ibrahim Gilany
Electrical Power Engineering Department,
Faculty of Engineering,
Cairo University

Prof. Dr. Doaa Khalil Ibrahim
Electrical Power Engineering Department,
Faculty of Engineering,
Cairo University

Associate Prof. Dr. Aboul'Fotouh Abdelrheem Mohammed
Electrical Power and Machines Department,
Higher Institute of Engineering,
El Shorouk Academy, Cairo

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Approved by the Examining Committee:

Prof. Dr. Mahmoud Ibrahim Gilany	**Thesis Main Advisor**
Prof. Dr. Doaa Khalil Ibrahim	**Advisor**
Prof. Dr. Samia Mohamed El-Hakim	**Internal Examiner**
Prof. Dr. Mahmoud Magdy Bahgat Eteiba **Faculty of Enginnering, Fayoum University**	**External Examiner**

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2020

Engineers Name: Mohamed Youssef Abd-Al-Glil Youssef Allam
Date of Birth: 1 / 1 / 1993
Nationality: Egyptian
E-mail: mohammedyoussefallam@gmail.com
Phone: +201028540868
Address: El Shorouk City, Cairo, Egypt

Registration Date: 01 / 10 / 2015
Awarding Date: / / 2020
Degree: Master of Science
Department: Electrical Power and Machines Engineering
Supervisors:
Prof. Dr. Mahmoud Ibrahim Gilany (Thesis main advisor)
Prof. Dr. Doaa Khalil Ibrahim (Advisor)
Associate Prof. Dr. Aboul'Fotouh Abdelrheem Mohammed

Examiners:
Prof. Dr. Mahmoud Ibrahim Gilany (Thesis main advisor)
Prof. Dr. Doaa Khalil Ibrahim (Advisor)
Prof. Dr. Samia Mohamed El-Hakim (Internal Examiner)
Prof. Dr. Mahmoud Magdy Bahgat Eteiba (Fayoum University)

Title of Thesis:

Detecting and Locating Winding Faults in Power Transformers

Key Words:
Artificial Neural Network (ANN), Identification and location of faults, Power transformers, Winding faults.

Summary:

Power transformers are essential elements in power systems and thus their protection schemes have critical importance. In this thesis, an online scheme is developed to observe the operating conditions of the connected transformer to assess the internal fault conditions. The proposed scheme depends on the relation (ΔV- I_{in}) which has the ellipse locus. According to the type of the fault, the ellipse dimensions vary and the scheme can effectively extract new features in order to classify and locate the deformation inside the transformer.

Two proposed approaches are developed and applied to deal with internal insulation failure problems within power transformer windings. The first approach is applied to classify five different internal insulation faults: inter disk, series short circuit and shunt short circuit, by applying artificial neural network with a reasonable accuracy. The second approach aims to find the exact location of the three types of internal faults along the transformer winding by dividing the transformer winding into sections.

Finally, the superiority of the proposed scheme to accurately discriminate and locate the power transformer internal faults is extensively examined by comparing its performance with some published schemes. Thus, it is concluded that it can be applied as a useful tool for condition assessment of transformers enabling power management system to spot the ones requiring immediate periodic maintenance or exchange without supply interruption.

DISCLAIMER

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the reference sections.

Name: Mohamed Youssef Abd-Al-Glil Youssef Allam

Date: / / 2020 Signature:

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