



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكرو فيلم

# بسم الله الرحمن الرحيم



**MONA MAGHRABY**



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التوثيق الإلكتروني والميكرو فيلم



# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكرو فيلم



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# 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



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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



**MONA MAGHRABY**



**NEW ANALYTICAL TECHNIQUES FOR BOTH DG  
HOSTING AND SIMULTANEOUS WITH  
DISTRIBUTION SYSTEM RECONFIGURATION TO  
REDUCE ELECTRIC POWER LOSS**

By  
**Mohamed Ahmed Sayed Ahmed Abdelkader**

A Thesis Submitted to the  
Faculty of Engineering at Cairo University  
in Partial Fulfillment of the  
Requirements for the Degree of  
**DOCTOR OF PHILOSOPHY**

in  
**Electrical Power and Machines Engineering**

**FACULTY OF ENGINEERING, CAIRO UNIVERSITY**

**GIZA, EGYPT**

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Under the Supervision of

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**Title of Thesis:**

New Analytical Techniques for Both DG Hosting and Simultaneous with Distribution System Reconfiguration to Reduce Electric Power Loss

**Key Words:**

Power flow; power loss reduction; distribution system; distributed generation; reconfiguration

**Summary:**

First, this thesis presents a new forward algorithm for balanced three-phase load-flow analysis of active and passive radial distribution networks (RDNs). Second, a successive analytical formula (AF) for system loss reduction to allocate multiple Distributed Generation (DG) units is deduced considering the mutual influence of all DG units. The effects of some operation changes are analytically included. Third, a Pivot for Simultaneous Reconfiguration and DG Hosting (PSRH) is introduced to analytically reduce the system loss based on a proposed Pivot Curve Analytical Tool (PCAT), which utilizes a single power flow run.

# 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 references section.

Name:

Date:

Signature:



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