



Cairo University

THE IMPACT OF DISTRIBUTED ENERGY RESOURCES ON THE RELIABILITY OF SMART ELECTRICAL DISTRIBUTION SYSTEM

By

Mohamed Mostafa Mahmoud Darwish

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

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Title of Thesis: **The Impact of Distributed Energy Resources on the Reliability of Smart Electrical Distribution System**

Key Words: reliability, distributed energy resources, distributed generation, demand side management.

Summary:

The integration of distributed energy resources (DER) into the power systems can provide the opportunity to supply electricity to consumers more efficiently and reliably. DER includes distributed generation (DG) and demand side management (DSM). In a smart grid incorporating automated control and distributed energy systems, an effective DSM can alleviate the peak load and shift part of the demand to off-peak hours. The aim of this thesis is to assess the impact of DG and DSM on the reliability of smart electrical distribution system by analyzing different case studies.

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

Name: **Mohamed Mostafa Mahmoud Darwish** ***Date:***

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Dedication

I dedicate this thesis to my parents, my wife and my best friends.

ACKNOWLEDGMENT

First of all, I wish to offer my great thanks to Allah who gives us the faith and hope to succeed.

Although my next few words couldn't express my deep feelings and respect towards my supervisors, but they may at least indicate some of those feelings.

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