



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



شبكة المعلومات الجامعية
@ ASUNET



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

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



يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%

بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم ترد بالاصل

Ain Shams University

Faculty of Engineering

OPTIMAL PLANNING OF TRANSMISSION NETWORKS

B5794

By

Eng. RAMADAN ELSYED BARHIM MOHAMED
, B.Sc., M.Sc.

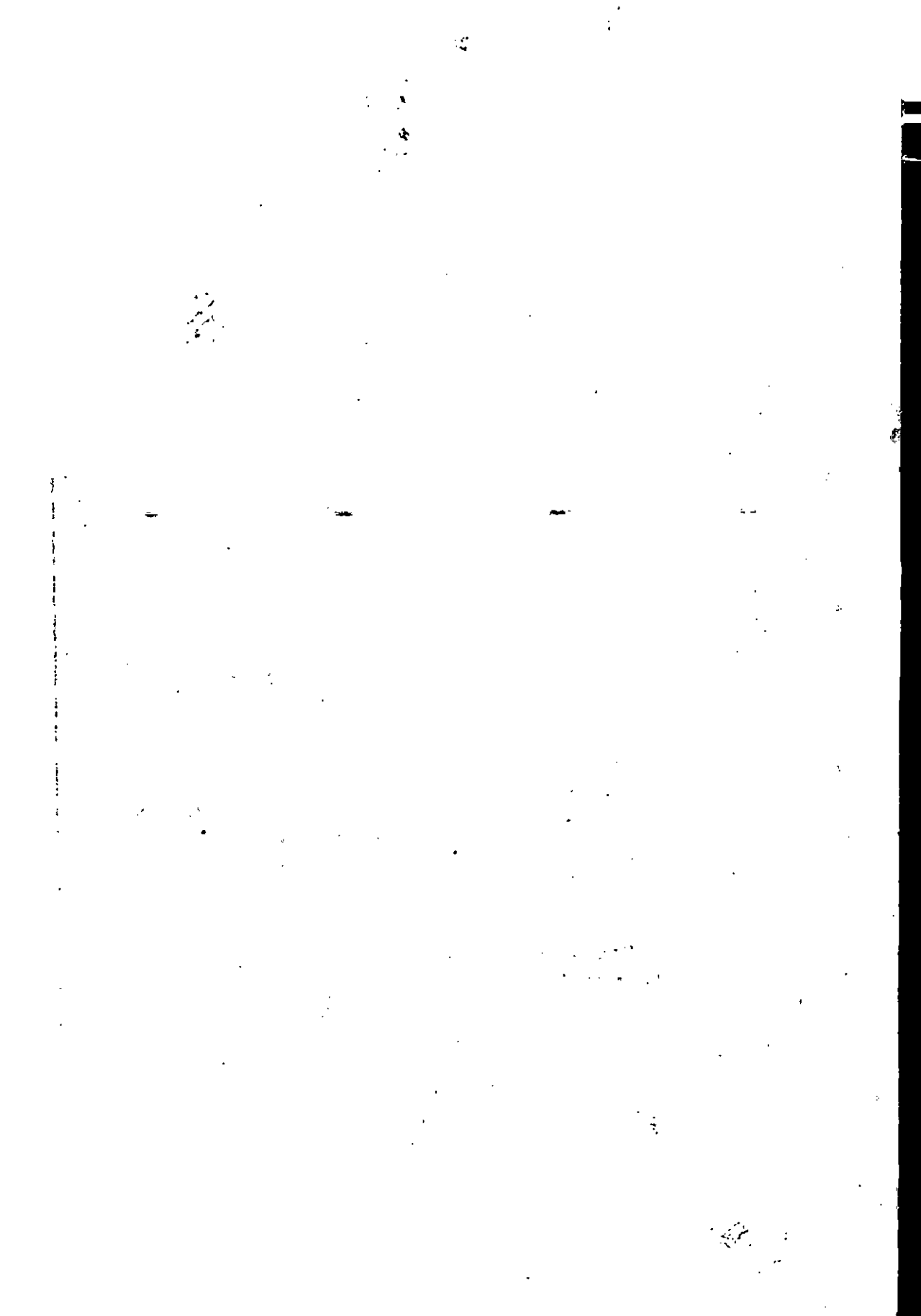
A Thesis

Submitted in Partial Fulfillment for the
Requirements of the Degree of Ph.D in Electrical
Engineering

Supervised By

Prof. Dr. Metwally EL-Sharkway &
Associate Prof. Hesham Kamel Temraz

Cairo- 1997



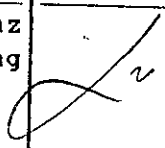
APPROVAL SHEET

OPTIMAL PLANNING OF TRANSMISSION NETWORKS

Eng. RAMADAN EL- SAYED BARHIM MOHAMED

B.sc, M.sc, in Electrical Power Engineering

This Thesis for the degree of Ph.D. in Electrical Engineering has been approved by : -

Name, Title and Affiliation	Signature
1. Prof. Dr. Ibrahim Mahmoud El- Shair Elect. Power & Machines Engineering Department Faculty of Engineering Ain- Shams University	
2. Prof. Dr. Ezzat Abd El-Aziz Mansour Electric Engineering Department. Collage of Engineering and Islamic Architecure Umm Al- Qura University Saudi Arabia	
3. Prof. Dr. Metwally Awad El-Sharkawy Elect. Power & Machines Engineering Department Faculty of Engineering Ain- Shams University	
4. Associate Prof. Hesham Kamel Temraz Elect. Power & Machines Engineering Department Faculty of Engineering Ain Shams- University	

Ain-Shams University

Faculaty of Engineering

Thesis of Ph.D. of Electrical Engineering

Student Name : Ramadan El-Sayed Barhim

Title of the Thesis :

OPTIMAL PLANNING OF TRANSMISSION NETWORKS

Degree : B.sc in Electrical Engineering, Assiut
University, 1979

M.sc in Electrical Engineering, Ain-shams
University, 1990

Under the Supervision of :

- 1- Prof. Dr. Metwally Awad El- Sharkawy, Electric
Power & Machines Engineering Department
2. Associate Prof. Hesham Kamel Temraz, Electric
Power & Machines Engineering Department.

STATEMENT

This thesis is submitted to the Faculty of Engineering Ain-Shams university for the Ph.D. degree in electrical engineering.

The work included in this thesis was carried out by the author in the department of electrical power and machines, Ain Shams university, 12 /11 /1990 -/ / 1997.

No part of this thesis has been submitted for a degree or a qualification at any other university or institution.

Date:

Signature:

Name: Ramadan Elsyed Barhim

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ABSTRACT

Currently, several transmission planning techniques are available for application. Those available techniques involve different planning assumptions which often lead to suboptimal, but not optimal, results.

The main objectives of this thesis are to develop algorithms and digital computer programs necessary for solving transmission planning problems. In this thesis, a new flexible and non-linear transmission planning model is proposed. The model can be applied to both static (single time step) and dynamic (multi time step) planning modes. In the proposed model, the cost function includes an accurate representation of the fixed cost of potential transmission lines and substations, the operating cost, and cost of losses for all existing and potential substations and transmission lines. The cost function is minimized subject to demand satisfaction constraints, line and substation capacity constraints, plant capacity constraints, stability constraints and logic constraints. In addition, different operating voltage levels, accurate power flow in each part of the system, interest and inflation rates are included in the newly developed model. One of the main feature of this work is the development of a new modified contingency analysis model. This model is very important and useful in securing system

reliability. Single, multiple, and severe contingency tests can be easily handled by this model. Application of the developed model and comparison with other available models results [25], have shown that the model is accurate, efficient and easy to apply.

This thesis is divided into five chapters.

In Chapter I, general introduction in which previous work is reviewed and the scope of the thesis is outlined. In Chapter II, mathematical modelling of the transmission planning and algorithms are described, In Chapter III, the Application of the model containing three different modes of study ; Static, Pseudo- dynamic and Dynamic modes and a comparison between them are presented. In addition, many different planning voltage levels (220 kv, 340 kv, 500 kv and 750 kv) are discussed and compared. In Chapter IV, a contingency analysis model and its application including some cases study for the purpose of reliability criterion are presented. In Chapter V concluding remarks are stated.