بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــســـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

Ain Shams University
Faculty of Engineering

Effect of HVDC Harmonics on Synchronous Machine Transient and Dynamic Behaviour

M. Sc. Thesis
By

Eng. Ahmed Mohamed Ahmed Abu Siada
B. Sc. Electrical Power Engineering

Submitted in Partial Fulfillment of the Requirements for the M. Sc. Degree in Electrical Engineering

Supervised By

Prof. Dr. Hamdy S. Khalil
Faculty of Engineering Ain Shams University

Prof. Dr. Somaya A. M. Shehata
Faculty of Engineering Ain Shams University

Dr. El-Sayed A. Mohamed
Faculty of Engineering Ain Shams University

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Approval Sheet

For the thesis entitled

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Approved By

Signature

Prof. Dr. Moataz Ahmed Zakaria Ghoneim
Faculty of Engineering El-Azhar University

M. Ghoneim

Prof. Dr. Mohamed Abd El-Reheem Badr
Faculty of Engineering Ain Shams University

M. A. Badr

Prof. Dr. Hamdy S. Khalil
Faculty of Engineering Ain Shams University

H. S. Khalil

Dr. El-Sayed A. Mohamed
Faculty of Engineering Ain Shams University

E. A. Mohamed

Date / /1998

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STATEMENT

This thesis is submitted to Ain Shams University in partial fulfillment of the requirements for the M.Sc. degree in Electrical Engineering.

The included work in this thesis has been carried out by the author at the Electrical Power and Machine Department, Ain Shams University. No part of this thesis has been submitted for a degree or a qualification at any other University or Institution.

Name : **Ahmed Mohamed Ahmed Abu Siada**

Signature :

Date :

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ABSTRACT

During the last four decades, a number of DC transmission links have gone into commercial operation in various parts of the world. Several other DC links are now under construction or proposed. One of the problems associated with the DC transmission is the generation of harmonic currents on both AC and DC sides.

These harmonics affect the AC system adversely and interfere with its operation. Their presence results in extra losses, interference with control and communication systems, and over voltages.

It is well known that the order and level of these harmonics can be influenced by the parameters of the system and converters as well as by the system operating conditions.

The main purpose of this thesis is :

(I) To simulate digitally a representative AC/DC system.

(II) To present comprehensive investigations on the effect of several parameters on the harmonic level . These are :

1. The MW proportion generated by the infinite and finite power systems.
2. The proportion of the power transferred to AC and DC loads.
3. The stiffness of the AC interconnected systems.

(III) To explore the impact of HVDC converter station faults on the torsional torques induced in turbine-generator shafts. Faults considered are:

1. Firethrough
2. Misfire
3. Short circuit across inverter terminals

The results of these investigations are presented in the form of typical time responses as well as harmonic spectra of each variable.