



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





شبكة المعلومات الجامعية



شبكة المعلومات الجامعية

التوثيق الالكتروني والميكرو فيلم

جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأفلام قد اعدت دون أية 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 %



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بعض الوثائق الأصلية تالفة



شبكة المعلومات الجامعية



بالرسالة صفحات

لم ترد بالأصل



**Ain Shams University
Faculty of Engineering
Electric Power&Machines Engineering Department**

**PERFORMANCE OF HIGH VOLTAGE
OUTDOOR POLYMERIC INSULATORS
UNDER DIFFERENT POLLUTED
CONDITIONS**

A Thesis

SUBMITTED BY

BAHAA ABD ALLA ARAFA

FOR

**The Ph.D.Degree in Electrical Engineering
Supervised by**

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Dr. Mohamed S. Rizk Dr. Omar A. Elgendy**

Ain Shams University

E.E.A

**Egypt
1999**

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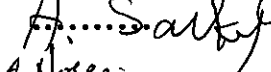
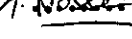
Approval Sheet

(PERFORMANCE OF HIGH VOLTAGE OUTDOOR POLYMERIC INSULATORS UNDER DIFFERENT POLLUTED CONDITIONS)

This thesis is submitted by Bahaa Abd Alla Arafa for the degree of Doctor of Philosophy in Electric Power Engineering.

The Examining Committee approves the thesis which satisfies the required standard of the Ph.D. degree in Electric engineering.

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بسم الله الرحمن الرحيم

"وعنده مفاتيح الغيب لا يعلمها إلا هو ويعلم ما في البر والبحر
وما تسقط من ورقة إلا يعلمها ولا حبة في ظلمات الأرض
ولا رطب ولا يابس إلا في كتاب مبين"

صدق الله العظيم

بسم الله الرحمن الرحيم

"سبحانك لا علم لنا إلا ما علمتنا أنك أنت العليم الحكيم"

صدق الله العظيم

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Title of Thesis:

**PERFORMANCE OF HIGH VOLTAGE
OUTDOOR POLYMERIC INSULATORS UNDER
DIFFERENT POLLUTED CONDITIONS**

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Bahaa A.Arafa

ABSTRACT

Bahaa Abd Alla Arafa "Performance of high voltage outdoor polymeric insulators under different polluted conditions" Ph.D. thesis, Electric Power&Machines Engineering- Ain Shams University.

Insulation contamination has become a major problem in the operation of electrical power systems. In wet condition disruptions of the power system can occur. When an insulator is polluted and subjected to wetting in humid conditions, the service power frequency voltage causes a leakage current to flow on the surface of that insulator. The leakage current has a thermal effect which causes evaporation of some of the water content of the pollution layer. Dry bands will establish and this will cause partial arcs, which may lead to flashover under certain conditions. If the leakage current is minimized or stopped, the bands will not exist and no flashover can occur.

This work presents the effects of sandstorms on the polymeric materials, which are widely used for outdoor insulation applications. Moreover, the experimental results of a study carried out to examine the environmental effects of sandstorms, ultraviolet and high temperature on the electrical performance of silicone rubber insulators (SR) are thoroughly investigated. The characteristics of outdoor polymeric insulators subjected to natural pollution in desert areas compared with the characteristics of the well known conventional ones (porcelain and glass) were also investigated. The comparison is mainly devoted to, the ability of