شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

Cairo University

SHIELDING OF PIPELINES IN CLOSE PROXIMITY TO SUBSTATION GROUNDING GRIDS

By

Mohamed Hassan Ahmed Ismael Elmashtoly

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
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Under the Supervision of

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Title of Thesis:

Shielding of pipelines in close proximity to substation grounding grids

Key Words:
Grounding system, Electric potential, Pipelines shielding, Passive grounding grid (PGG), Outward conductors (OCs)

Summary:

The protection of pipelines adjacent to power substations against electric disturbance -during power system abnormal operation or lightning- is of paramount importance. One proposed method of implementing effective shielding is by the construction of a shielding wall between the substation's grounding grid and the external installation to be protected. This thesis deals with this problem and offers a methodology, by which the optimal wall dimensions and location are sought. In doing so, the economics of the shielding wall construction is considered as well. A method that enhances the mitigation of potentials, proposes building a passive grounding grid (PGG) beneath the pipeline. A combination of a grounding passive grid (PGG) that passes under the pipeline together with a shielding wall would achieve this goal. The thesis examines the relative effectiveness of the PGG and the wall by properly simulating them using finite-elements algorithms. An experimental model setup is used to verify the proposed concept.

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.

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Signature:

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