بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة /صفاء محمود عبد الشافى

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لايوجد

PERFORMANCE OF HIGH VOLTAGE DIRECT CURRENT CIRCUIT BREAKER DURING AND AFTER ARC INTERRUPTION PROCESS.

By

Mohamed Niazi Taha Elfikky

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

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

Performance of High Voltage Direct Current Circuit Breaker during and after Arc Interruption Process.

Key Words:
HVDC; CB; Arc interruption; Fault; Modelling

Summary:

In this thesis we simulated the arc using 2 different methods to gain an inclusive view over the different factors that affect eh arcing process. First, we used the MATLAB Simulink tool to simulate the arc using Mayr arc model, which gave us the current and voltage of the CB during the fault interruption process. Then we used ANSYS fluent to simulate the physical arc model which give us a good explanation for the interaction between arc and fluid flow inside the braker during the interruption process. We found that the interruption of the pole to ground fault would cause an immense heat to be generated leading to a decrease in dielectric strength of the SF6 gas after the arc is interrupted leading to a discharge around the hollow contact, we also found that the decrease in solid contact diameter would cause a decrease in interruption capabilities of the CB.

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.

Name: Mohamed Niazi Taha Elfikky Date: / /2022

Signature:

Dedication

This work is dedicated to my parents, who taught me that there’s never an impossible for those who try.

Acknowledgments

First of all, thanks to Allah who supported and strengthened me in all of my life and in completing my studies for Master of Science (M.Sc.) degree.

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