الآية

(قُلْ إِنَّ صَلَاتِي وَنُسُكِي وَمَحْيَايَ

وَمَمَاتِي لِلَّهِ رَبِّ الْعَالَمِينَ)

سورة الأنعام الآية (162)

Dedication

This Research is lovingly dedicated to my respective parents who have been my constant source of inspiration. They have given me the drive and discipline to tackle any task with enthusiasm and determination without their love and support this project would not have been made possible.

Acknowledgement

First of all I have to thank A'llah for the accomplishment of planned objectives .

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Abstract

The continuous growth of electrical power demand especially in the developed countries has led to large and complex interconnected networks. A DC super grid is an evolved grid system that manages electricity flow in a sustainable manner. Using of DC system decrease transmission losses and enables connection of network with different frequencies.

This research investigates and simulates the creation and interconnection of four regional dc networks. Two scenarios are done during normal and outage conditions on Simulink Matlab software.

المستخلص

ان التزايد المستمر على طلب الكهرباء خاصة في الدول المتقدمة أدى الى تكوين شبكات كهربائية كبيرة ومعقدة. الشبكة العملاقة ذات الجهد المستمر هي عبارة عن شبكة مترابطة تقوم بتبادل الطاقة الكهربائية بين الشبكات الإقليمية. إستخدام نظام الجهد المستمر يقلل المفاقيد ويؤدي إلى إمكانية ربط شبكتين ذواتي تردد مختلف .

يقوم هذا البحث - مستخدما نظام المحاكاة- بتقييم شبكة ربط ذات جهد مستمر لربط أربع شبكات إقليمية. تم عمل سيناريوهين في حالة الوضع الطبيعي وفي حالة خروج جزء من الشبكة باستخدام برنامج الماتلاب .

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LIST OF ABBREVIATIONS

HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
VSC	Voltage Source Converter
CSC	Current Source Converter
LCC	Line Commutated Converter
IGBT	Insulated Gate Bipolar Transistor
GTO	Gate turn-off Thyristor
PWM	Pulse Width Modulation
PI control	Proportional plus Integral control
AC/ac	Alternating current
DC/dc	Direct Current.
PLL	Phase Lock Loop.
SFO	Switching Frequency Optimal.
ENTSO	European Network of Transmission System Operators for Electricity.
UHV	Ultra High Voltage.
SIL	Surge Impedance Loading .
RES	Renewable Energy Sources.
CB	Circuit Breaker.
PMU	Phasor Measurement Units.
STATCOM	Static Synchronous Compensator.
BESS	Battery Energy Storage System.
PCC	Point of Common Coupling.
SPWM	Sinusoidal Pulse Width Modulation.
INN	Intelligent Neural Network.