الآية

بسم الله الرحمن الرحيم

﴿أَمَّنْ يَهْدِيكُمْ فِي ظُلُمَاتِ الْبَرِّ وَالْبَحْرِ وَمَنْ يُرْسِلُ الرِّيَاحَ بُشْرًا بَيْنَ يَدَيْ رَحْمَتِهِ ۗ أَإِلَٰهٌ مَعَ اللَّهِ ۚ تَعَالَى اللَّهُ عَمَّا يُشْرِكُونَ﴾

صدق الله العظيم

النمل٦٣

Dedication

for my dears' father and mother, whose give me the experiences and love in live.

for my dear husband , who gives me good environment .

for my brothers and sister, whose give me there attention & encouragement.

for my colleagues, who give me there hands' to continue.

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In the name of Allah, the Most Gracious and the Most Merciful Alhamdulillah, all praises to Allah for the strengths and His blessing in completing this thesis.

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Abstract

Today, all the world direct towards renewable sources, because it is considered a safe energy. As a result, now the studies concentrate about the reliability and continuity of the renewable energy. Though, this thesis presents a recovery strategy that enables the system of HVDC transmission systems based on voltage source converter, which transfer electrical power from the wind turbines to the grid, to ride-through different positions of AC faults with minimum current and voltage stresses on the converter switching devices. Issue such as control strategies for a VSC-HVDC transmission system connecting offshore wind farms to the power network is discussed. A reduced network model has been implemented in MATLAB/ SIMULINK to assess control performance during the fault.

مستخلص

كل العالم اليوم يتجه نحو استخدام مصادر الطاقة البديلة لأنها تعتبر من الطاقات الآمنة .وبما أن العالم اتجه إلي توليد الطاقة الكهربائية باستخدام طاقة الرياح، لذلك ركزت معظم الدراسات الحالية علي موثقيه واستمرارية الطاقة المتجددة. لذلك هذا البحث تناول ألاستراتيجيه التي تمكن منظومة قدرة كهربائية لنقل الطاقة الكهربائية من محطات توليد الكهرباء بطاقة الرياح إلي الشبكة العامة عبر خط نقل الجهد العالي للتيار المستمر لمبدلات الجهد، بعد أن تتعرض المنظومة المقترحة إلي أعطال التيار المتردد من مواقع مختلفة بأقل اجهادات للجهد والتيار علي معدات مفاتيح المبدلات. قضية مثل إستراتجية التحكم لمبدلات القدرة الكهربائية للجهد العالي للتيار المستمر التي توصل مزارع توربينات الرياح بالشبكة الكهربائية نوقش. نفذ ذلك النموذج باستخدام برنامج الماتلاب \سيمولنك لتقييم الأداء أثناء الأعطال.

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Table of Abbreviations

HVDC	High Voltage Direct Current
VSC	Voltage Source Converter
FERC	Federal Energy Regulatory Commission
LCC	Line Commutated Converter
CCC	Capacitor Commutation Converter
FSIG	Fixed Speed Induction Generator
DFIG	Doubly-Fed Induction Generator
DTC	Direct Thermocouple Control
PCC	Predictive Current Control
SVM	Space Vector Modulation
NPC	Neutral Point Clamped
M2C	Modular Multilevel Converter
ESCR	Effective Short Circuit Ratio
SPWM	Sinusoidal Pulse Width Modulation
PLL	Three-Phase Locked Loop