الآيـــــــــــــــــة

قال تعالى:

{قُلْ إِنَّ صَلاَتِي وَنُسُكِي وَمَحْيَايَ وَمَمَاتِي لِلّهِ رَبِّ الْعَالَمِينَ * لاَ شَرِيكَ لَهُ وَبِذَلِكَ أُمِرْتُ وَأَنَاْ أَوَّلُ الْمُسْلِمِين}

صدق الله العظيم..

الأنعام162-163

DEDICATION

To my father, mother and my friends.

ACKNOWLEDGMENTS

On the completion of this thesis work, it is my proud privilege to express my deep sense of gratitude towards my supervisor **Dr. Giddani O. Addalan**, Assistant Professor, SUST for his invaluable guidance, constant encouragement, suggestions, great patience, and continuous technical support which helped me, survive through crest and troughs of my thesis work and completed successfully. It is a great privilege to work under him, who motivated me in every course of my work and made me believe in myself.

I would like to take this opportunity to thank Engs. Mustafa, Essar, Abuzar, Esmat, Salma and Duaa, SEDC for their continued cooperation and support in sending me the data's that are required for my studies.

I am very happy to express salutations to my parents because, my success, my failure, indeed everything I own, belongs to them. I would also like to thank one and all of my M.Sc. classmates for giving me constant encouragement, inspiration and suggestions.

I would also like to express my deep affection and best wishes to my loving brothers Shakir and Mubarak for always being there to listen to me.

ABSTRACT

Reliability of distribution systems is an important issue in power engineering for both utilities and customers. Reliability is a key issue in the design and operation of electric power distribution systems and load. Reliability assessment of distribution systems has been the subject of many recent papers. The modeling and evaluation techniques have improved considerably.

The system modeling and simulation study is carried out on the district's distribution system which consists of 11kV network in Khartoum distribution management. The reliability analysis is carried out for Alebour 11 kV overhead line to assess the performance of the present system and to improve its reliability indices. The alternatives which give low SAIDI, SAIFI and minimum breakeven costs are being assessed and considered.

The reliability of 11kV system could be further improved by installation of load break switch (LBS), auto recloser swithes and connecting the line with other coming from other distribution substation (to be ring system) or other point for the same line at reasonable installation cost.

مُستخـــــــــــــلص

موثوقية نظم التوزيع هي اهم بند في هندسة القوى وذلك بالنسبة للمؤسسات او الزبائن، تعتبر الموثوقية المسألة الاساسية في تصميم وتشغيل نظم توزيع القوى الكهربائية والاحمال. تقييم موثوقية نظم النوزيع اصبح موضوعاً لعدة اوراق علمية حديثة. النمذجة وطرق التقييم قد تطورت إلى حد بعيد.

دراسة نمذجة ومحاكاة النظام أُجريت لمنطقة توزيع الخرطوم والتي تحتوي على شبكة 11 كيلوفولت في الادارة العامة لتوزيع كهرباء الخرطوم. تم تحليل الموثوقية لخط العبور11 كيلوفولت الهوائي لتقييم الاداء للنظام الحالي ولتحسين مؤشراته. البدائل التي تُعطي أقل قيمة لـSAIDI وSAIFI وأقل تكلفة ارباح تم تقييمها وإعتمادها.

موثوقية نظام الـ 11كيلوفولت يمكن ان تتحسن الى حد أبعد بتركيب مفاتيح فصل الحمل(LBS)، مفاتيح اعادة القفل التلقائي وتوصيل الخط مع خط اخر من محطة اخرى (ليصبح نظام حلقي) او توصيله من نقطة اخرى في نفس الخط عند تكلفة تركيب مناسبة.

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List of abbreviations

SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
CAIDI	Customer Average Interruption Duration Index
ASAI	Average Service Availability Index
HL	Hierarchical Level
GA	Generic Algorithm
ASIFI	Average System Interruption Frequency Index
ASIDI	Average System Interruption Duration Index
CENS	Cost Of Energy Not Supplied
SEDC	Sudanese Electricity Distribution Company
LBS	Load Break Switch
MTTR	Mean Time To Repair
MTTF	Mean Time To Failure
MTTS	Mean Time To Switch
MTBF	Mean Time Between Failures
WTA	Willingness To Accept
WTP	Willingness To Pay
DVR	Dynamic Voltage Regulator
SSTS	Solid State Transfer Switch
VBRP	Value Based Reliability Planning