بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

قال تعالى:

**{وَسَخَّرَ لَكُمُ الشَّمْسَ وَالْقَمَرَ دَائِبَيْنِ وَسَخَّرَ لَكُمُ اللَّيْلَ وَالنَّهَارَ }**

سورة ابراهيم 33

**{إِن يَشَأْ يُسْكِنِ الرِّيحَ فَيَظْلَلْنَ رَوَاكِدَ عَلَىٰ ظَهْرِهِ إِنَّ فِي ذَٰلِكَ لَآيَاتٍ لِّكُلِّ صَبَّارٍ شَكُورٍ }**

الشوري 33

# Dedication

To Those Who Gave Us Their Time, Love and Care Our Parents,
Our teachers and every one inside Sudan University

To Our New Family 31 Batch

# ACKNOWLEDGMENT

All praise and thanks is due to Almighty ALLAH. I wish to thank Him for that entire blesses He has gifted us with, though He can never be praised or thanked enough.

I am heartily thankful to my supervisor, Dr. Khams Arbish, whose encouragement, guidance and support from the initial to the final level enabled me to develop an understanding of the project.

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Deepest gratitude are also due to my respectful eng .Badr Aldin Add Alrahmman at Electrical Loss Reduction Project and eng. Huzifa at the Jabra Distribution Centre; whom their knowledge, assistance and kindness facilitate a lot of difficulties facing me in this project.

I would also like to convey thanks to the Faculty for providing the financial means and technical facilities.

# ABSTRACT

Power losses in electrical system referred to the difference between the magnitude of power generated and power consumed. The need for reducing electrical power losses either in transmission or distribution is came from the high cost that the utility incurs. There are two causes of distribution losses, technical and nontechnical. The causes of each one of them were investigated in this project and corresponding solutions to reduce them were adopted.

In this project study have been done about the distribution transformer and cables losses with power factor effect in these losses by measure the transformer noload and short circuit test data.

This project objectives successfully met by obtaining the major causes of distribution losses in Sudan and finding out the optimum solutions.

# المستخلص

خسائر الطاقة في المنظومة الكهربائية ترجع إلى الفرق بين مقدار الطاقة المولدة في محطات التوليد والطاقة المستهلكة من قبل الزبائن وتظهر الحاجة إلى تقليل فقودات الطاقة الكهربائية في شبكات النقل والتوزيع بسبب التكلفة العالية التي تتكبدها المصلحة المولدة للكهرباء بسبب وجود هذه الفقودات هنالك نوعان من انواع الفقودات الكهربائية تظهر في شبكات التوزيع وهي الفقودات الفنية والفقودات غير الفنية (التجارية).

في هذا المشروع تمت دراسة مفقودات المحول بإجراء اختبار القصر واختبار اللا حمل لتحديد قيمة المفقودات وتأثير تحسين معامل القدرة عليها كما تم حساب قيمة مفقودات الكيبل المستخدم في جانب الجهد المنخفض

تم التوصل لأهداف المشروع المتمثلة في معرفة أسباب الفقودات الكهربائية في شبكات التوزيع وإيجاد الحلول المثالية للحد منها

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# LIST OF APREVIATIONS

| | |
|---|---|
| I | Line Current |
| R | Resistance |
| P | Real Power |
| L | Cable Length |