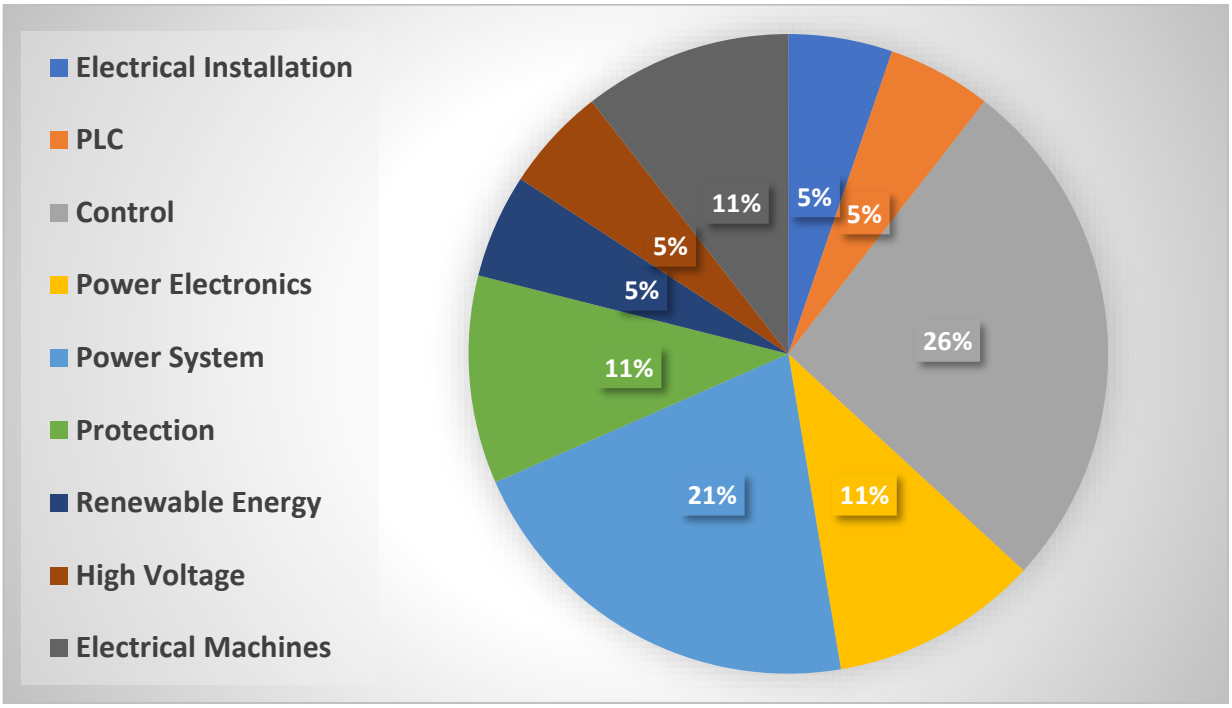
2022/2023

Graduation Projects Summary

Electrical Engineering Department
Faculty of Engineering
Menoufia University

بيان بنسب التخصصات المختلفة لمشاريع التخرج



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١٨	Protection of Series-Compensated Transmission Systems	Protection	Dr. Mahmoud Elgamasy
١٩	Process Optimizing, Energy Saving and Transparence Factory	Control - (Industrial Collaboration- Elaraby Group))	Prof. Awad Elsabbe Eng. Abd El-Naseer Tahon

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جامعة المنوفية
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Project title:

A Two-Stage Method for Optimal Placement of Distributed Generations and Capacitors in Distribution Networks

Supervised by: Dr. Mohamed Taha Mouwafi

Work team:			
1	Ahmed Yasser Noman Ramadan	**6**	Ahmad Emad El-Din Shalaby
2	Ahmed Magdi Aboelfetoh Elhewalla	**7**	Aziza Abas Hassan Mohammed
3	Ahmed Ashraf Samy Shalaby	**8**	Mohamed Ibrahim Mohamed Elroghi
4	Mohamed Ahmed Elsayed Kishk	**9**	Ahmad Mohamed Desukey
5	Alaa Attaa-Eldin Hassan	**10**	Ahmad Mohamed Amer

Abstract:

The major loads are connected to the network through the distribution systems. Therefore, the quality of the service is based on the continuity of power and maintaining the supply voltage within certain limits with specified frequency. Due to the rapid spread in the loads, the long distance of radial structure and the high R/X ratio of lines, the power loss reduction and voltage profile improvement are the challenge. To solve these problems, the distributed generations (DGs) and shunt capacitors are installed on the radial feeders for active and reactive power injections. Therefore, the optimal locations and sizes of DGs and capacitors in distribution systems can be formulated as a constrained optimization problem. In order to solve this problem, the optimization techniques are applied. This project presents a two-stage procedure to determine the optimal placement of DGs and capacitors with an objective of power loss reduction for improvement the voltage profile in radial distribution systems. In first stage, VSF is used to select the candidate locations for the DGs and capacitors. The suggested VSF is based on the following physical quantities; the variation of the active power losses with respect to the level of active power at variant nodes, the variation of the active power losses with respect to the level of reactive power at variant nodes. In second stage, the equilibrium optimizer (EO) is introduced to find the optimal locations and sizes of DGs and capacitors considering the minimization of total power loss as objective function, while the security and operational constraints are fully achieved. The backward/forward sweep (BFS) algorithm is introduced for the load flow calculations. The proposed procedure is applied on 34-bus standard radial distribution system and East Delta Network (EDN) distribution system as a part of the Unified Egyptian Network (UEN) in order to solve the optimal DGs and capacitors placement problem. The obtained results are compared with other methods. Simulation results show the capability of the proposed procedure to find the optimal solution for significant minimization in the objective function with more accuracy and efficiency.

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Project title:

Investigation and Mitigation of MV Cable Joint Failures

Supervised by: Prof. Dr. Nehmdoh A. Sabiha

Work team:			
1	Mahmoud Adel Ahmed Zahra	**7**	Mohamed Tamer Abd-Elmaksoud etwaly
2	Mohamed Ahmed Mohamed Fetouh Srour	**8**	Mohamed Reda Abd-Elmaged Ads
3	Mohamed Ahmed Mohamed Saleh	**9**	Mohamed Reda Moad Algamal
4	Mohamed Hossam Mustafa Abd-Elaziz	**10**	Mohamed Zanaty Khalifa Ismail
5	Mohamed Hosny Mohamed Elhanafy	**11**	Mohammed Samir Abd-Eltawab Mahmoud
6	Mohamed Salah Shaban Elkorashy	**12**	Mohamed Samir Soliman Hadhod

Abstract:

Each cable system has an insulation system, consisting of three different types of components, which are cable parts, terminations, and cable joints. The reliability of this system depends on the quality of all individual components. Cable joints are subjected to more failure in a cable system compared to other components, due to many reasons. The most significant reasons are because of higher electrical, mechanical, and thermal stresses. Material properties of these joints play an important role for these failures such as relative permittivity, volume resistivity and breakdown voltage. The insulation material of a joint depends on what types of cables are used. Therefore, mitigation of power cable joint failures is highly required for getting better performance. In this project, MV cable joint is simulated by Finite Element Method (FEM) using COMSOL Multiphysics. MV cable joint using COMSOL Multiphysics concerning the published geometry and materials is simulated. The impact of different dielectric constants of the high permittivity layer (HPL), ethylene propylene rubber (EPR) layer, and semiconducting layer on electric field distributions is studied. Then, the best material for each layer that gives the best electric field distribution is selected. The importance of stress control tubes in MV cable joints considering the most common materials is declared. The distributions of electric field and potential along MV cable joint with and without stress control are estimated. To study the impact of MV cable joint defects, cable joint leakage currents with and without defects are experimentally measured and analyzed using a fast Fourier transform (FFT). Then, electric field distortion is declared considering different defects using COMSOL Multiphysics. Accordingly, general guidelines to minimize these defects are listed. Finally, condition monitoring of the cable system is declared.

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Project title:

Design and Performance of Three-phase Axial Flux Switching Alternators for Wind Energy System

Supervised by: Prof. Dr. M.M. El-shanawany

Work team:			
1	Ahmed Ibrahim Abdel-Salam Mahmoud	**8**	Tarek Yahya Mostafa Mahmoud
2	Ahmed Abd El_maqsoud Abd Elaty Gad	**9**	Abdelhameed Ibrahim Fathy Ibrahim
3	Ahmed Eid Abd El Salam Mostafa	**10**	Mohamed Anwar Mahmoud Diab
4	Ahmed Mohamed Ibrahim Galous	**11**	Mohamed Hamdy El-Sayed Hegazy
5	Osama Alaa Labib Tahoon	**12**	Mohamed Essam Mohamed El-Hady rahim
6	Islam El Sayed Abd-alghani Salman	**13**	Sameh Nasr Ibrahim Abo-Elnaga
7	Ashraf Ibrahiem Abd El_maqsoud Tarshon		

Abstract:

Wind energy is the most suitable option for providing energy to rural areas and it is also an essential part of the Distributed Generation systems. In all these systems, cost and ease of installation and maintenance are major factors. Owing to growing concerns on energy utilization and environmental protection, research on electric vehicles and wind power generation has drawn much attention in the past few decades. As a key component of these applications, the development of electric machines has become an important research topic since the last century. The permanent- magnet brushless machines have dominated the industrial and domestic markets, for many years due to their outstanding performance when compared to their counterparts. However, the PM material takes disadvantages of relatively high cost, limited resource, and uncontrollable magnetic flux. which makes it become increasingly important to consider reduced or even no PM FSMs. Therefore, with the absence of PM materials, the advanced magnet less doubly salient brushless machines that provide great cost effectiveness have become more popular recently. These machines are called "Flux Switching Machines". The axial flux switching machine (AFSM), or also called switched flux machine, falls into a family of machines with an excitation source in the stator. This machine operates on the principle that the EMF is generated from coupling of flux through coils by virtue of a salient rotor providing varying permeance along the airgap. The flux switching machine has been actively studied over the past decades as it offers high efficiency and high-power density. The purpose of this project is to investigate the characteristics of existing magnet less flux switching machines, analyze their design III philosophies and propose new topologies for various applications. Firstly, the background of magnet less machines and previous works conducted by other researchers are introduced. Based on the study of the existing works, the upcoming trend, and the potential development are also reviewed. Secondly, the dual-rotor three-phase FSM, is proposed for wind power generation. Then, all the key performances of the proposed machines are thoroughly analyzed by the finite element method (FEM), while the experimental setups have also been developed to verify the proposed concepts.

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Project title:

Design and Implementation of an HMI-PLC Controlled Elevator

Supervised by: Dr. Tamer Fetouh

Work team:			
1	Amr Mahmoud Khater	**7**	Amr Mahmoud Gomaa
2	Abd El Basset Mahmoud	**8**	Ziad Saad ELGazir
3	Omar Wael El-Tokhy	**9**	Ahmed Muhammad Shahat
4	Muhammad Ibrahim Awad	**10**	Anton Rizk Youssef
5	Gerges Samier Gerges	**11**	Muhammad El-Sayed Enab
6	Ibrahim Mostafa Abdrabou		

Abstract:

Nowadays, elevators provide reliable mobility in all types of buildings, from high-rises to residential and commercial settings. The objective of the present work is to design and implement a prototype traction elevator, develop a control system using Programmable Logic Controller (PLC), and apply a modern and accurate method to determine the cabinet position along the hoistway. Throughout the present work, different elevator types and components are studied. A laboratory setup based on a PROFIBUS network consists of two PLC S7-313C-2DP and two HMI TP-177B is interfaced to the elevator prototype that uses an encoder to locate the cabinet position. A control logic algorithm using Ladder Diagram is developed to register the floor calls and requests then respond in the most efficient order. For the convenience of the users, Human Machine Interface (HMI) screens are designed and implemented within the system. An extensive experimental work has been carried out and the results verify that the developed prototype is an efficient tool to study and investigate traction elevator systems for educational and training purposes.

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Project title:

Design and Implementation of AC Drives for Electric Vehicle Applications

Supervised by: Dr. Dina Osheba

Work team:			
1	Ahmed Barakat Gaber	**8**	Esraa Ahmed Mowafy
2	Ahmed Mahmoud Salem	**9**	Manar Samy Hammad
3	Ahmed Mohammed Abd-Alrahman	**10**	Nehad Abd-Albaset Heriba
4	Akrm Esmail Said	**11**	Nourhan Osama Zaher
5	Mahmoud Salem Rady	**12**	Rahma Saeed Mohammed
6	Mohammed Abd-Alnasser Khalifa	**13**	Sohaila Mohammed Gomaa
7	Mohammed Abd-Elaty Elkomy		

Abstract:

We couldn’t imagine a world today without electricity, and as we already know, it can be transmitted in two different ways, namely: alternating currents (AC) or Direct current (DC). Although AC is the main electric current, DC is still widely used and with the rise of renewables, batteries, and electronic devices it is expected to regain in popularity in the coming years. One of the main advantages of DC electricity is that it is easier to store than AC. In addition, DC plays a major role in renewable energies and electric vehicles. Indeed, it can be directly produced by solar panels and stored in batteries. The main advantage of AC is its capacity to be transported over long distances with minimal energy loose (the wire will not overheat). Therefore, reducing the size of the wires and the cost of energy transmission. Converting DC (direct current) to AC (alternating current) has played a major role in the transition toward renewable energy. DC to AC power converters are essential if you want to use electricity from: - Batteries of Electric Vehicles - Solar batteries - Solar panels - Domestic wind turbines - Uninterruptable Power Series (UPS). On the one hand, these systems named above mostly produce, store, and use DC electricity, on the other hand, the international standard for electrical devices and home appliances is AC electricity. Therefore, there is a need for an efficient DC to AC power converters both for domestic and industrial use.

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Project title:

Inter-Level Voltage Fault Analysis and Protection

Supervised by: Prof. Dr. Nagy I. Elkalashy

Work team:			
1	Mustafa Rashed Kamel Mohamed	**5**	Youssef Fawzy Abdel-monem El-harbawy
2	Mahmoud Tarek Ismail El-Ghamry	**6**	Medhat Tarek Hashem Ahmed Atallah
3	Youssef Samir Abdel-Azim Abo khallaf	**7**	Mahmoud Ebrahim Mustafa Elsheikh
4	Mahmoud Gamal Amin El-ders	**8**	Elsayed Tarek Elsayed Elnabarawy

Abstract:

The inter-voltage fault is a fault between two separate lines with different voltages and phases. The inter-level voltage fault is analyzed. Two essential protection functions are implemented. They are distance protection and differential protection. These two protection functions are implemented and evaluated. They are distance protection and differential protection. These two protection functions are implemented and evaluated. This book presents an analytical analysis of inter-voltage level fault and proposes a protection function for it. It also covers the designing of a digital distance relay for conventional faults. The ATP program is used to implement a practical network in order to obtain fault cases. These fault cases are considered to test and evaluate the protection functions. The differential protection function is designed and applied for detecting the inter-level voltage fault. Although the fault is detected, it causes damage in the network elements especially around power transformer and the low-level voltage arrestors.

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Project title:

Electrical Power Department Smart Elevator Using Arduino Controller

Supervised by: Prof. Attia Elsebaey

Work team:			
1	Ibrahim Gamal Ali Elsheikh Ali	**7**	Omar Mostafa Roshdy Sehly
2	Ibrahim Saeed Ahmed Younes	**8**	Ghadeer Saleh Elsayed Elnoamny
3	Ahmed Hamdi Mohamed Elsayed	**9**	Fatma Radwan Mohamed Farhat
4	Ahmed Khaled Ahmed Eldaoshi	**10**	Kamal Abdelhamid Abdelaziz Elnemr
5	Elsayed Kamel Elsayed Abo Elghar	**11**	Nehal Magdy Elrefay
6	Gehad Khaled Azzam	**12**	Youssef Zakaria Mohamed Abbas

Abstract:

The aim of this graduation book is to present the development of a Smart Arduino Elevator that utilizes a Mega Arduino microcontroller, H-bridge, seven-segment display, push buttons, push button as load cell, LEDs, buzzer, smoke detector, ultrasonic sensor to determine the floor number and another one to detect incoming people to the cabin to light up the LED, Bluetooth module, LM35DZ Temperature Sensor, and DC motor. The Proteus software was used for simulation purposes. The research begins with an overview of the elevator system and an introduction to the components used in the project. The research methodology employed was a combination of literature review, theoretical analysis, and experimental investigations. The development process of the Smart Arduino Elevator is presented in detail, including the design, implementation, and testing phases. The results of the study demonstrate that the Smart Arduino Elevator is an effective and efficient system that can be used in various applications. The system was able to accurately detect the weight of the cabin using the push button as a load cell, determine the cabin's location using the ultrasonic sensor. Furthermore, the system was able to communicate with external devices through the Bluetooth module and provide real-time temperature readings using the LM35DZ Temperature Sensor. Overall, this graduation book contributes to the field of Power and Electrical Machines Engineering by presenting a detailed and comprehensive study of the development of a Smart Arduino Elevator. The system has practical applications in various settings and can be used to enhance the safety and efficiency of elevator systems.

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Project title:

Smart Rotary Garage System

Supervised by: Prof .Dr. Ashraf Zein El Din

Work team:			
1	Abdullah Rafat Mohamed Abdel-Maaboud	**7**	Mahmoud Hafez Mohamed Rehan
2	Abeer Hassan AbdElkawy Khodair	**8**	Mahmoud Sobhy Shebel Khedr
3	Haggag Ragab Haggag Mansour Rafea	**9**	Moustafa Ahmed Saleh Shareb
4	Mohamed Abd Elsalam Hassan Gewaly	**10**	Mustafa Ibrahim Muhamed
5	Mohamed Amr Mosaad Amer	**11**	Omnia Roshdi Ali Eid
6	Mohamed Nasser Abd Elhazeem Hadad	**12**	Tahani El-Sayed Ahmed

Abstract:

Designing and implementation of smart rotary garage system model.
The project consists of the following Items:
-Programmable logic controller (PLC).
-Stepper motor.
-Acleric.
-Mechanical parts.
-Guide way with its component.
-Capacitive sensor 3 wires.
-Relays.
-Power sources Simulation, Modelling of the project are presented.
Experimental set-up of the project is presented. Finally, smart rotary garage system model project is tested.

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Project title:

Energy Saving for Induction Motor

Supervised by:

Prof. Dr. Fathy Abd-Elkader
Dr. Mervat Abd-Elber

Work team:			
1	Abdel-Fatah Mohamed Abdel-Fatah	**9**	Salah Yahya Abdel-Hamed Mohammed
2	Abdel-Monem El-sayed Abdel-Monem	**10**	Mohamed Ahmed Mohamed Hekal
3	Abdel-Rahman Wael El-Sayed Awadallah	**11**	Mohamed Ashraf Hassona Sherif Sroor
4	Abdel-Raoof Nasser Goda Elgozier	**12**	Mohamed Ayman Ahmed Foud Sharaf
5	Abdel-Reheem Mohamed Mohamed	**13**	Mohamed Rabea Soliman Elghool
6	Ali Hamdei Ali Ahmed	**14**	Mohamed Ramadan Ibrahim Gad
7	Hossam Ahmed El-sayed Brik	**15**	Mohamed Shawky Abdel-Hamid
8	Ramadan Mohammed Elwy Sukait		

Abstract:

For modem cities, motor drive systems can consume over half of all electricity. Furthermore, those systems can consume over 75% of all electricity in an industrial plant. Motor drives are popularly applied in airconditioning, fans, pumps, compressors, chillers, escalators, elevators, and industrial drives. Common motor drives include induction motor drives, dc motor drives, synchronous motor drives, switched reluctance motor drives, as well as other motor drives. Among these drives, induction motor drives are most popular in various applications in industrial field and home appliances due to their inherent merits such as simple structure, less maintenance, good operating performance, and low price. They are the most electrical devices consuming electricity in the electrical grid. Hence, increasing the efficiency of these motors has received great attention.

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Project title:

Improvement of Educational Equipment of the Instrumentations Lab

Supervised by: Prof. Dr. Ahmed Abdallah Mohamed

Work team:			
1	Ahmed Reda Ahmed Alwan	**9**	Shoaib Nasser Abdelmotaleb
2	Ziad Mohamed Elabsawy	**10**	Saeed Anter Saeed Amin
3	Abdelrahman Ashraf Amer	**11**	Mohamed Hany Elabsawy
4	Mohamed Hany Sherif	**12**	Hussein Alsayed Abu Youssef
5	Mohamed Mostafa Ali	**13**	Ahmed Salama Aboelkomsan
6	Mustafa Ali Mohamed	**14**	Mahmoud Sobhy Abdelhy
7	Shokry Kotb Sharaf	**15**	Eslam Osama Abdlhamed
8	Mohamed Alaa Eldeen Mhrez	**16**	Mahmoud Ayman Nassar

Abstract:

Many engineering curricula include courses that use laboratory experiments to enhance the students thinking and problem-solving skills. The objective is normally to prepare students to apply effective solutions to real world problems, including the ability to identify alternative solutions, design circuits, and test systems. This project presents a set of experiments that allow students to experiment with electrical circuits of varied levels of difficulty based on predetermined specifications. The topics addressed include: Measurements errors, moving coil instrument, moving iron instrument, electrodynamic instrument, DC and AC bridges, oscilloscope, and sensors. A major expectation is that students either have or must develop skills in reading and interpreting data sheets, especially normal and maximum ratings. In response to a request from the Department of Electrical Engineering to adopt a project for improvement of educational equipment for the instrumentations Lab. A nominated teamwork consisting of 16 students from the Department of Electrical Engineering, this team was responsible for carrying out this task under the supervision of Prof. Ahmed Abdallah. The 16 students are divided into 4 Groups The four Groups tasks are: Group (1) is responsible for preparing Lab report setup. Group (2) is responsible for preparing Pre-Lab readings information sources (Softcopy). Group (3) is responsible for preparing Lab Arrangements. Group (4) is responsible for preparing Arduino trainer kit. Each Group presents report which describes how they have dealt with aforementioned tasks, their roles and a fully works documentations. This project presents good solutions to renew and develop the work system in the electrical measuring instruments laboratory, which can share to ensure the quality of work in the department laboratories. The project shows how to Increase the laboratory capacity while reducing the number of students participating in each experiment. Also, the project how to increase students interaction in the laboratory. Finally, the project presents excellent method to deal with high technology, sensors, and programming.

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Project title:

Smart and Economical Multi-Purpose System for Irrigation and Agricultural Purposes

Supervised by: Dr. Eman Salah Ali

Work team:			
1	Adham Mohamed Abdel Wahab	**8**	Nourhan Osama Kensowa
2	Ahmed Gamal Mostafa Eissa	**9**	Osama Ashraf Abdel fatah
3	Ahmed Ibrahim Abu El Hassan	**10**	Rahma Essam Hussein
4	Ahmed Tamer Mohy Eldeen	**11**	Roba Hassan Abdel aziz
5	Aya Youssef Hamed	**12**	Salma Majid Ibrahim Beda
6	Enas Hamdy Ibrahim Moaaty	**13**	Sara Khalid Saad Ahmed
7	Mohab Ezzat Younis	**14**	Yara Ezzat Mohamed Omran

Abstract:

Land and water are the basic needs for agriculture and economic development of the country. According to international water management institute (IWMI), one – third of the world's population will face absolute water scarcity by the year 2025. Sprinkler irrigation systems are efficient method of providing irrigation water into soil with minimum amount of water and alsomit minimizes conventional losses such as deep percolation, runoff and soil erosion. In this project, a proposed model for a new and smart technology for irrigation process. The proposed system aims to improve the sprinkler irrigation process and reduce the cost of establishing the irrigation system and also reduce the operating cost during irrigation by saving the electrical energy consumed during the irrigation process as a mechanical system moving under the gravity. The proposed system model is controlled by programmable logic controller (plc) which detects the state of all inputs (float switch , limit switches and bush buttons) then sends output commands to (valves , motors and relays), DC motors are used to move the system along agricultural land and the system could be multi-purpose by using it not for only irrigation but also for plowing and sweeping.

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Project title:

Design of Multi-Level Inverter for Solar Energy Applications

Supervised by: Prof. Dr. Awad E. A. El-sabbe

Work team:			
1	Mostafa Ebrahim Mewally Saleh	**7**	Elsayed Basheer Elsayed mahrous ata
2	Mostafa Ghareeb Mohammed	**8**	Ali Khaled Mohamed Ali Badr
3	Moaz Ebrahim sadek Elshenawy	**9**	Ahmed samy mohamed Ibrahim kabeel
4	Saleh Abdelhafez Saleh elzefzafy	**10**	Zyad Samir Aohamed Ammar
5	Mostafa emam mohamed Zayed	**11**	Osama mohamed abdelmalak
6	Abdelrahman Gamal Zaki Mohamed		

Abstract:

The Inverter is an electrical device which converts direct current (DC) to alternate current (AC). The inverter is used for emergency backup power in a home. The inverter is used in some aircraft systems to convert a portion of the aircraft DC power to AC. The AC power is used mainly for electrical devices like lights, radar, radio, motor, and other devices. Now a day's many industrial applications have begun to require high power. Some appliances in the industries however require medium or low power for their operation. Using a high-power source for all industrial loads may prove beneficial to some motors requiring high power, while it may damage the other loads. Some medium voltage motor drives and utility applications require medium voltage. The multi-level inverter has been introduced since 1975 as alternative in high power and medium voltage situations. The Multi-level inverter is like an inverter and it is used for industrial applications as alternative in high power and medium voltage situation Recently multilevel inverters are emerged as very important factor in high power and medium voltage application. Number of inverter topologies have been introduced and used for various applications. Among these inverters cascaded MLI is used because of its advantages over other MLIs. Different control techniques are available to control these inverters. Simulation outputs of three phase five level cascaded H-Bridge, Diode clamped, flying capacitor MLIs are analyzed in MATLAB software.

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Project title:

Performance Enhancement of Electric Power Systems Including FACTS

Supervised by: Dr. Ragab Ahmed Abdelaziz

Work team:			
1	Abdelaleem Abdelsattar Abdelsalam	**7**	Fatma Nabil Mahmoud Shehata
2	Alaa Ezzat Abdel Fattah El-Sabahy	**8**	Hamed Hamdi Hamed Osman
3	Ali Essam Ali Shaban	**9**	Khaled Samir Abd Elmoaty Farag
4	Ali Subhi Ali Youssef	**10**	Manar Badr Farid Mohamed
5	Amany Abdelghani Mohamed Hamza	**11**	Omnia Essam Mohamed Mohamed
6	Badr Amr Badr Eldin Elsharkawy	**12**	Rawda Rabee Abdelhakim

Abstract:

Modern electric power systems are large scale systems with a complex structure comprised of meshed and interconnected networks to guarantee adequate load supply .Power systems are continuously subject to unpredictable and sudden operating point variations due to changes of generation and fluctuation of loads ،switching of lines or increasing such loads in the system .The aim of management and control is then to plan, coordinate and quickly perform suitable and effective actions on the system with respect to its limits; as Such disturbances will initiate low frequency power system oscillations which should be consequently endangering the overall stability of the system. Ones the low frequency oscillations started, they would continue for a while and disappear, or continue to grow causing system separation. In modern power system operation, the low frequency power system oscillations initiated by disturbance have been one of the major concerns. The oscillations may sustain and grow to cause system separation if adequate damping is not available. Over last 25 years, the problems of low frequency power system oscillations have assumed importance. The frequency of oscillation is in the range of 0.2 to 2.0 Hz. In the recent years, many efforts have been dedicated to damp these low frequency oscillations, additional positive damping is required which can be provided by supplementary excitation control. In the late 1950‟s and early 1960‟s most of power systems used automatic voltage regulators (AVR) to provide useful damping to the power system to maintain the overall stability of the power system.

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Project title:

Analysis and Enhancement of Electric Distribution Networks

Supervised by: Dr. Heba Abdel-Hamied Khatta

Work team:			
1	Muhammed Hassanien Muhammed Sabry	**8**	Abd-Elrahman Yousry Foaud Ammar
2	Ahmed Yasser Abdel-Haliem	**9**	Aya Tarek Mahmoud Rabeh
3	Eslam Hamdy Mobarak Mohamed Helal	**10**	Shimaa Saeed Abd-Elaziz Muharram
4	Ahmed Elamir Mohamed Shafik Elkady	**11**	Belal Mohamed Abd-Elmoneem Hikal
5	Ahmed Tarek Abd-Elkawy Younis	**12**	Ibrahim Tarek Azab Mohamed
6	Ahmed Elsayed Saad Dawood	**13**	Eslam Mohamed Mahmoud Salama
7	Abd-Elhameed Ashraf Sakr		

Abstract:

As the name of the project describes, the aim of the project was to study low voltage distribution networks and analyze them to specify all the problems to solve them. The book was divided into five chapters: Chapter (1): It presented the general definition for the power system including the main three stages generation, transmission and distribution, reliability and stability of the power system, problems facing any power system and how to solve them. Chapter (2): It studied the load flow of IEEE 33-Bus distribution system using ETAP software and the load flow of a practical case in Shamma medium voltage distribution network which was a full study for the system. Chapter (3): It used the exported data from ETAP load flow to do mathematical calculations on IEEE 33-Bus distribution system and Shamma medium voltage distribution network using loss sensitivity and normalized voltage factor for optimal DG placement. Chapter (4): It studied the load flow of IEEE 33-Bus distribution system using MATLAB software and the load flow of a practical case in Shamma medium voltage distribution network which was a full study for the system. It uses the exported data from MATLAB load flow to do programmable calculations on IEEE 33-Bus distribution system and Shamma medium voltage distribution network using Practical Swarm Optimization (PSO). Chapter (5): It was a practical application for a new and renewable source of energy, solar energy, as a common type of DG technique. Three software programs were used to achieve a good simulation PV-Sol, PV SYST and Sketch.

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Project title:

Study and Design of On-Grid Solar Photovoltaic System

Supervised by: Dr. Asmaa Farid Nasef

Work team:			
1	Hamed Ashraf Hamed	**7**	Abdallah Labeb Shendy
2	Abdallah Mohamed Abdallah	**8**	Abdallah Ahmed Sharaf
3	Mohamed Ahmed Hamad	**9**	Eslam Fathy Hassan
4	Omar El-Sayed Mohamed	**10**	Hossam Essam Mostafa
5	Mohamed Khaled Mahrous	**11**	Abdallah Khaled Draz
6	Ayman Ahmed Abdelsatar	**12**	Khaled Ibrahim Ragab

Abstract:

By studying the total loads of the campus through reviewing the monthly bills during the year 2021, the consumed power from the grid was determined, taking into consideration that most of this consumption occurs during the morning period, which is the working time of the campus. The maximum load of the campus was also calculated, which was around 300 kW. Based on this, two designs were made to supply the campus with power. The first design utilized all the building roofs, which were six in total, with a production capacity of 784.6 kW and a cost of 13,937,935 LE. The second design was installed on the roofs of two buildings, the Electrical Engineering Department building, and the Civil Engineering Department building, with a production capacity of 315.6 kW and a cost of 5,580,280 LE, as of June 2023. In the second case, the cost of the station will be covered over ten years through the cost that was previously paid by the campus to the grid, which was an average of 50,000 LE per month. Studies were conducted on the photovoltaic station in case of connection with the grid to determine the voltage impact in case of voltage drop, as well as changes in the distribution losses ratio and the impact of the station's capacity on the grid in three stages: non-connection, connection with a capacity of 784.6 kW, and connection with a capacity of 315.6 kW.

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Project title:

Design of 66/22 kv Gas insulated substation (GIS)

Supervised by: Prof. Dr. Ragaey saleh

Work team:			
1	Gad Mahmoud Abdel Karim	**7**	Karim Ibrahim Abd al-Maqsud
2	Kamal Al-Shahat Zina	**8**	Mohamed Salah El-Nagar
3	Mohamad Adel Amer	**9**	Mohamed Ali Mohamed Ali
4	Mohamed Mohamed Said	**10**	Mahmoud Saber Ramadan
5	Mahmoud Alaa Madkour	**11**	Omaima Ashraf Serag
6	Amira Hafez Al-Fakharani		

Abstract:

The Project objective is to design ALQAWMYIA EAST FOR CEMENT GIS indoor type substation includes 3 x 40 MVA 66/22kV transformers. The substation is being built on an area of 72m*52m .The substation will be connected with(Qattamyia 1 and Qattamyia 2) 66-kV network via four (4) circuits 66 kV OHTL, two (2) circuits from the local power grid as phase I, and two (2) circuits as Phase II in the future. The design process is divided into 2 main phases: 1.5.1 Substation Primary Design In this phase, the main bulk equipment of the substation is discussed, sized, and selected, according to pre-calculations made such as Short-Circuit, Load Flow and Grounding Calculations. According to the previous calculations, main equipment such as Power Transformer, HV & MV Switchgears, Busbars and Switching Devices are sized. And lastly, the Auxiliary System that maintains the substation operation, and considered a pillar for the Secondary phase. 1.5.2 Substation Secondary Design This phase is considered mainly about AC single line diagram, DC single line diagram and Protection. As the equipment selected in the previous phase are very important and expensive, it needs to be protected from faults they could occur. The protection is divided mainly into 3 zones which are Power Transformer, Busbar and Feeder Protections.

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Project title:

Design of Electrical Power Distribution for Office Building

Supervised by:

Prof. Dr. Mustafa El-Shebiny
Prof. Dr. Elwy El- Kholy

Work team:			
1	Abanoub Makram	**7**	Ahmed Khaled salah
2	Ibrahiem Emad	**8**	Ahmed Adel Ibrahiem
3	Ahmed Ibrahiem Shaban	**9**	Ahmed Metwally Mohamed
4	Ahmed Ehab Ahmed	**10**	Osama Aref Abdelmomen
5	Ahmed Gamal Salama	**11**	Samy Shawqy Mohamed
6	Ahmed Hafez Mahmoud	**12**	Mohamed Samir Gamal

Abstract:

This graduation project aims to design the full electrical distribution system for office building. In this project, we aim to provide drawings of a proper design of lighting, sockets, power outlets, feeding circuits and single line diagrams. This project also provides necessary tables and charts of electrical boards and loads schedules, we also designed low current systems including fire alarm system, data system, telephone system, CCTV system and sound system**.**

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Project title:

Protection of Series-Compensated Transmission Systems

Supervised by: Dr. Mahmoud Elgamasy

Work team:			
1	Ahmed Walid Gbreel.	**7**	Eslam Gamal Awadallah.
2	Ahmed Sameh Sayed.	**8**	Saeed Wesal Abo Seeda.
3	Ahmed Mohammed Abdel Monsef.	**9**	Alaa Allah Nagy Ibrahim.
4	Ahmed Mohammed ELGarhy.	**10**	Yara Abdel Nabi Abu AL-Hasan.
5	Osama Mohammed Abo Youssef.	**11**	Monira Rafik Mahmoud.
6	Mahmoud Gamal Gaber.	**12**	Naira Nashat El Rifai.

Abstract:

The use of Flexible Alternating Current Transmission Devices (FACTS) for reactive power compensation offers a lot of benefits. However, these devices affect the distance protection scheme in transmission lines. One of the factors that affects the distance protection is Metaloxide-varistor (MOV). MOV is used to protect the series compensation against overvoltage during faults. The MOV-protected series compensation increases the complexity of fault analysis and device protection. Hence the performance of distance protection scheme in the presence of FACTS is negatively affected. The first chapter can identify the faulty side with respect to the compensator (SC). The modified mathematical algorithm of the distance relay treats with these faults via compensating the voltage drop through the SC to integrate the relay performance along the line. Consequently, the faulty side either upstream or downstream the SC must be identified. The second chapter introduces a communication-aided scheme to enhance the fault detection, and fault location calculation for a thyristor-controlled series capacitor (TCSC) compensated transmission lines. In the proposed method only the current data at the remoteend should be synchronously sent to the local end. The proposed algorithm is independent of fault resistance, power flow direction, and pre-fault condition. In the proposed method the TCSC parameters are not utilized in the derived fault location formula and as a result, the performance of the proposed method is not impacted due to variations in TCSC parameters. The third chapter introduces a current-based algorithm for one-end fault location in series capacitor compensated double-circuit transmission lines. In this chapter, considering the MOV model and zero-sequence mutual coupling impedance between the two circuits, a new algorithm is presented for the location of single-line-to-ground faults, using currents measured at one end of the line. In this algorithm, first, a fault location is obtained for each data window, and then the exact location is calculated using statistical techniques. The proposed algorithm is independent of the measured voltages, and as a result, no error in the voltage measurement affects its accuracy. In addition, needing no telecommunication channel to access the data of the remote substation leads to reliability increasing and cost reductions. Not requiring pre-fault data is another advantage of the algorithm. The last chapter introduces a Fault Detection Technique for the Series-Compensated Line during Power Swing. The detection of fault in a series-compensated line during the power swing is further complicated due to complex transients produced by series capacitor and the metal–oxide varistor (MOV) protecting it. This paper proposes a negative-sequence current-based technique for detecting all types of faults during the power swing in a series-compensated line.

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Project title:

Process Optimizing, Energy Saving and Transparence Factory

Supervised by:

Prof. Awad Elsabbe
Eng. Abd El-Naseer Tahon

Work team:			
1	Moaz Tarik Mohamed Farag	**4**	Karm Samy Mohamed Amra
2	Mahmoud El-Sayed Mohamed Younes	**5**	Mostafa Mohamed Farag Meghawry
3	Khaled Ahmed Fahmy Abd-Elmonem	**6**	Youssef Ahmed Mohamed Samir Salama

Abstract:

This project, sponsored by ElAraby Group, aims to save energy by rescheduling the foam machines to reduce losses caused by no-load operation. By using a PLC (Programmable logic control) system to control the machines and an HMI (Human Machine Interface) to adjust variables, we hope to optimize the operation of the foam machines and reduce energy consumption. This project has the potential to significantly reduce energy costs for ElAraby Group Banha sector foam factory and improve the efficiency of their operations. After research into the energy consumption of the factory which consumes around 11% of the entire factory complex, it was found that a significant amount of those losses is caused by the no load losses of the boilers and compressors ,because they simply run at nearly no-load most of the time and nearly full load for a fraction of the time. our project focuses mainly on the solution of this problem by reducing the maximum capacity of the boilers and compressors by spreading the load evenly across the entire operation of the boilers and the compressors. First, in order to achieve a better efficiency of the machine ,we needed the program used for it, so the first step of the project was to simply recreate the software needed to run the machines without any modifications, then our main objective was to add a PLC to control the factory in its entirety and connect all the PLCs in the factory together we called this PLC the Master or the Interlock PLC, while the PLCs for the machines was either called that or they were called the Slave PLCs. The main idea was to make sure that the use of the boiler and compressor never exceeds a certain value, a value which we will make sure is the max load of the boilers and compressor. we achieve this by connecting all the PLCs into a single PLC as mentioned before and when a machine requires the usage of either steam or compressed air the master PLC will check whether the resource is available ,if it was available then it will allow the machine which requested the resource to use the resource ,whether it was steam or compressed air that same logic applies. if the resource was already at the max allowed then the machine shall not be allowed and it will be added to the end of a queue, this queue is for making sure that the first machine that got blocked is the first machine to be allowed to use the resource when the resource is freed. After creating the software, it is to be downloaded to a large set of PLCs for testing purposes then results from those PLCs which was not connected to machines will be collected and compiled to see ,whether the system is satisfactory for the productivity of the factory or not.