TECHNICAL REPORT

ON

STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

AT

FEAR GOD FIRST COMPUTER ELECTRICAL ENGINEERING

BY

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SUBMITTED TO

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

NATIONAL DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

KWARA STATE POLYTECHNICS

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FOR THE AWARD OF NATIONAL DIPLOMA IN ELECTRICAL AND

ELECTRONICS ENGINEERING

DEDICATION

I dedicate this report to God who gave me the grace and strength to finish my SIWES program successfully and my parents who helped in providing all the necessary resources.

ACKNOWLEDGEMENTS

First and foremost, these few paragraphs will be unable to do justice to those who I owe a big debt of gratitude for the successful completion of my SIWES.I hereby appreciates God Almighty for giving me the Grace, Opportunity and Strength to complete my industrial training successfully. I also wish to acknowledge the University for giving me the opportunity to participate in the Student Industrial Work Experience Scheme (SIWES). Finally, I would like to acknowledge my supervisor for his guidance and support throughout my training period.

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REPORT REVIEW

I did my industrial attachment at the electrical department of **FEAR GOD FIRST COMPUTER ELECTRICAL ENGINEERING** Ilorin where I was at first observe how to manipulate some electrical equipment/tools before I was allowed to be manipulate them for use on my own.

During my SIWES programmed. I gained wealth of experience in the

1. High Tension unit
2. Low Tension unit (Domestic Installation).

Also the report contained the problem faced as well as some suggestion to the scheme improvement.

CHAPTER ONE

INTRODUCTION

1.1BACKGROUND

The Industrial Training Fund established by decree 47 was introduced in 1971, vis-à-vis the birth of the Students Industrial Work Experience Scheme (SIWES) the same year by the Federal Government of Nigeria (FGN). It is an integral part of the requirements for the award of Certificates, Diplomas, and Degrees in higher institutions of learning i.e. Colleges of Education, Polytechnics, Universities, etc. Student Industrial Work Experience Scheme (SIWES) exposes students to industry-based skills necessary for a smooth transition from the classroom to work environments. It accords students of tertiary institutions the opportunity to familiarize themselves with the needed experience in handling machinery and equipment which are often found in such an educational institution.

OBJECTIVES OF SIWES

The primary objectives of SIWES are:

1. **Bridge the gap between theory and practice**: **SIWES** aims to provide students with practical exposure to complement the theoretical knowledge they acquire in classrooms. By working in real-life industrial environments, students can see how concepts learned in school are applied in practice.
2. **Enhance employability**: The program helps students develop essential skills, including technical and soft skills, which are highly valued by employers. Through industrial training, students gain firsthand experience in the workplace making them better prepared for employment after graduation.
3. **Familiarize students with modern technologies and equipment**: **SIWES** gives students the opportunity to work with advanced tools, machines, and technologies that they may not have access to in school. This exposure ensures that students are up to date with industry standards.
4. **Promote industry-academia collaboration**: The scheme fosters a close relationship between academic institutions and industries, ensuring that students receive relevant training and that academic curricula are aligned with industry needs.
5. **Improve students' problem-solving abilities**: By working in a real industrial environment, students are exposed to challenges and practical problems that require innovative solutions. This helps sharpen their problem-solving and critical-thinking skills.
6. **Prepare students for leadership and teamwork roles**: **SIWES** promotes collaboration and teamwork, as students often work in teams to achieve project goals.

This experience helps build leadership and teamwork skills, essential for career growth.

7. **Provide insights into workplace culture**: The program helps students gain an understanding of professional ethics, workplace culture, and communication, which are vital in any professional setting.

CHAPTER TWO

2.1 Location

Alagbon Area Oyo State

2.2 FEAR GOD FIRST COMPUTER ELECTRICAL ENGINEERING

CHAPTER THREE

3.1 WORK EXPERIENCED IN INSTALLATION DEPARTMENT

For the second month of my SIWES at Davelaw Technology, I was transferred to installation department.

In installation department, I was basically involve in installation of inverter, battery, sc panel and electrical equipment.

3.10 INVERTER: Is an electric device that changes direct current (DC) to alternating current (AC).

The input voltage, output voltage, frequency and handling depend on the design of the specific device. The inverter does not produce any power. The power is provided by the DCsource.

Inverter is rated in KVA (kilovolt amps)

Input Voltage

A typical power inverter device requires a relatively stable DC power source capable of supplying enough current for the intended power demands of the system. The input voltage depends on the design and purpose of the inverter. Examples include;

- 12 VDC, for smaller consumer and commercial inverters that typically run from a rechargeable 12v lead-acid battery.
- 24, 36 and 48 VDC, which are common standards for home energy systems.
- 200-400, when power is from solar panels.

Output Waveform

An inverter can produce a modified sine wave, or pure sine wave depends on circuitdesign.

There are two basic designs for producing household plug-in voltage from long-voltage DC source, and then convert to AC.

The second method converts DC to AC at battery level and uses a line frequency transformation to create the output voltage

Output Frequency

The AC output frequency of a power inverter device is usually the same as standard power lin frequency, 50 or 60 hertz. If the output of the device or circuit is to be further conditioned (for example, stepped up) then the frequency may be much higher for good transformation efficiency.

Output Voltage

The AC output voltage of a power inverter is often regulated to be the same as the grid line voltage, typically 120 or 240 VDC at the distribution level, even when there are changes in the load that the inverter is driving. This allows the inverter to power numerous devices designed standard line power. Some inverters also allow selectable or continuously variable output voltages.

Output Power

Inverter will often have an overall power rating expressed in Watts or Kilowatts. This describe the power that will be available to the device the inverter is driving and indirectly, the power t will be needed from the DC source. Smaller popular consumer and commercial devices desigr to mimic line power typically range from 150 to 300 watts.

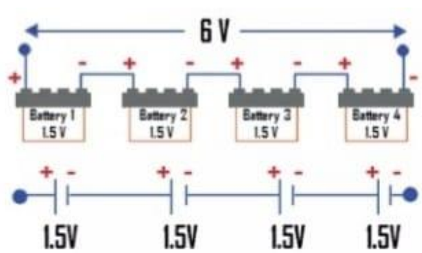
3.11 BATTERY

The runtime of an inverter is depended on the battery power and the amount of power being drawn from the inverter at a given time. As the amount of equipment using the inverter increases, the runtime decreases. In order to prolong the runtime of an inverter, additional batteries can be added to the inverter.

When attempting to add more batteries to an inverter, there are two basic options forinstallation.

1. Series Configuration

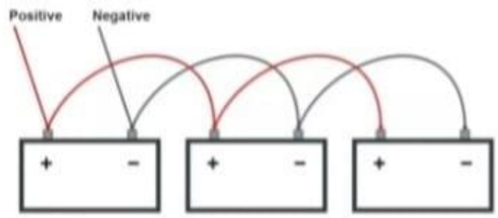
In a series configuration, voltage increase. This type of connection can only used for more than 124 power inverter system. In a series configuration, if a single battery died, the other battery will not be able to power the load.



1. Parallel Configuration

In a parallel connection, the capacity increases and prolong the runtime of the inverter. This increase the overall ampere hour (Ah) rating of the battery set.

If a single battery is discharged through the other batteries will then discharged through it This can lead to rapid discharge of the entire pack, or even an over current and possible power. To avoid this, large paralleled batteries may be connected via diodes or intelligent monitoring with automatic switching to isolate an under voltage batteries from others



3.12 SOLAR PANEL

Solar panel absorbs the sunlight as a source of energy to generate electricity or heat A photovoltaic (PV) module is a packaged connect assembly of typically 6 x 10 photovoltaic solar cells.

Photovoltaic module constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential application. Each module is rated by its DC output power under Standard Test Conditioned (STC) and typically ranged from 100 to 365 watts (W). The efficiency of a module determines the area of a module given the same rated output of a 16% efficient, 250 watts module. There are a few commercial available solar module that exceed efficiency of 22% and reportedly also exceeding 24%

3.2 THE ACTIVITIES PERFORM IN INSTALLATION DEPARTMENT

3.5KVA/48V Inverter with Solar Panel Installation for domestic use

Parameter:

5KVA Inverter

4x12V/200Ah Batteries

8x100W Solar Panels

48V, 100A Charge Controller

Solar and battery rack

PROCEDURE:

✓ Firstly, the load was first isolated from the distribution board (DB) i.e the separation of lo that will work with inverter from other load in the house.

✓The batteries was connected together in series configuration to produce 48V output.

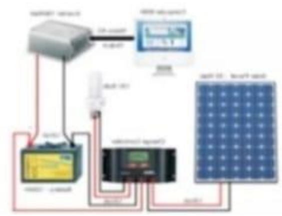
✓The inverter was connected to the batteries and it powered ON for testing and OFF immediately.

✓The solar panel was mounted on the roof using solar rack and it was connected in series and parallel configuration.

The output from the solar panel was connected directly to the charge controller.

✓The output of the charge co  ies in order to charge the batteries with the required vol

✓ All the connection was properly checked and tested using multi-meter.



✓ The system was powered ON

CHAPTER FOUR

4.1 SUMMARY

During my four-month industrial training at **FEAR GOD FIRST COMPUTER ELECTRICAL ENGINEERING**, I gained invaluable experience working in the power distribution sector. This placement provided me with hands-on experience in the departments of Protection & Control (P&C), Network Planning & Design (NP&D), Dispatch, and Fitter, which collectively equipped me with practical skills, theoretical knowledge, and a deeper understanding of power distribution systems.

SKILLS ACQUIRED

Throughout my SIWES placement, I developed both technical and professional skills essential for a career in electrical engineering:

- **Technical Skills:** Calibration of relays, fault isolation techniques, load analysis, network design, transformer testing, and equipment installation. These skills reinforced my practical knowledge and ability to apply theoretical concepts.
- **Analytical Skills:** Load flow analysis, demand forecasting, and fault analysis taught me how to approach problem-solving from an analytical perspective, using data to support decision-making.
- **Communication and Teamwork:** Collaborating with various departments improved my interpersonal skills and taught me the value of effective communication in coordinating tasks with field crews and providing customer support.
- **Safety and Compliance Awareness:** Observing and adhering to safety standards across departments emphasized the importance of maintaining safe working conditions, especially around high-voltage equipment.

4.2 SUGGESTIONS FOR IMPROVEMENT

For the improvement of student industrial work experience scheme (SIWES). I thereby suggest that.

1. SIWES should try and be paying money for the industrial training (I.T) program before or immediately after the program so as to motivate the students
2. SIWES should create a time of orientation for organizations. In case of misused of I.T students
3. The supervisor should please increase the number of time to visit student in his/her place of attachment

4.3 CONCLUSION

The SIWES program at **FEAR GOD FIRST COMPUTER ELECTRICAL ENGINEERING** has been a great experience, bridging the gap between theory and practice.

It has equipped me with practical skills in electrical operations, system monitoring, and fault handling while emphasizing the importance of safety and teamwork in technical environments.

Through exposure to real-world challenges, I have gained a better understanding of the responsibilities and complexities involved in maintaining a stable power distribution network. This experience has prepared me to face similar challenges in my future career, where I hope to apply the knowledge and skills I acquired to make meaningful contributions to the field of electrical engineering.

Overall, this placement at **FEAR GOD FIRST COMPUTER ELECTRICAL ENGINEERING** has been an enriching and transformative experience. It has given me a well-rounded exposure to the power distribution sector, honed my technical abilities, and instilled a professional work ethic. As I complete my final year studies, I am eager to apply the knowledge and skills I've gained, contributing to advancements in the power sector and supporting Nigeria's drive for improved and sustainable energy infrastructure.