TECHNICAL REPORT

ON

STUDENTS' INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)

Undertaken at

BASH NIGERIA-ELECTRICITY MANAGEMENT AGENCY

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DEDICATION

I am delight to dedicate this report to Almighty Allah who gave me the grace and opportunity to complete this programme.

ACKNOWLEDGMENT

I thank God Almighty for his mercy and grace that kept me all through my SIWES period.

I am greatly indebted to my parents. **Mr & Mrs OLANIYAN** for their morally, spiritually and financially, word of encouragement and prayer given to me, who make my SIWES programme successful.

I also want to thank my friend and everyone that contributed to the success of my SIWES program my Industrial supervisors, my colleagues and co-workers for the tremendous moral assistance throughout the period of my attachment.

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CHAPTER ONE

1.0INTRODUCTION

Student industrial work experience (SIWES) is a programme organized by industrial training fund (I.T.F) purpose to improve practical knowledge of the student in an institution.

The student industrial work experience (SIWES) is a program in Nigeria Institution accepted to improve the practical skills of students and as a partial fulfillment of the requirement for the award of first degree. The accepted skill training program (SIWES) is expected to bridge the gap existing between the theory and real practical in various fields such as engineering and technology, science, agriculture, medicine, management and other professional educational programs in Nigeria tertiary institution.

Students Industrial Work Experience Scheme (SIWES) is a compulsory programme for all university and polytechnic students, mandated by Industrial Training Fund (ITF). Mainly it is the NDI, 300 and 400 level students depending on the year of graduation and the minimum duration of 16 weeks.

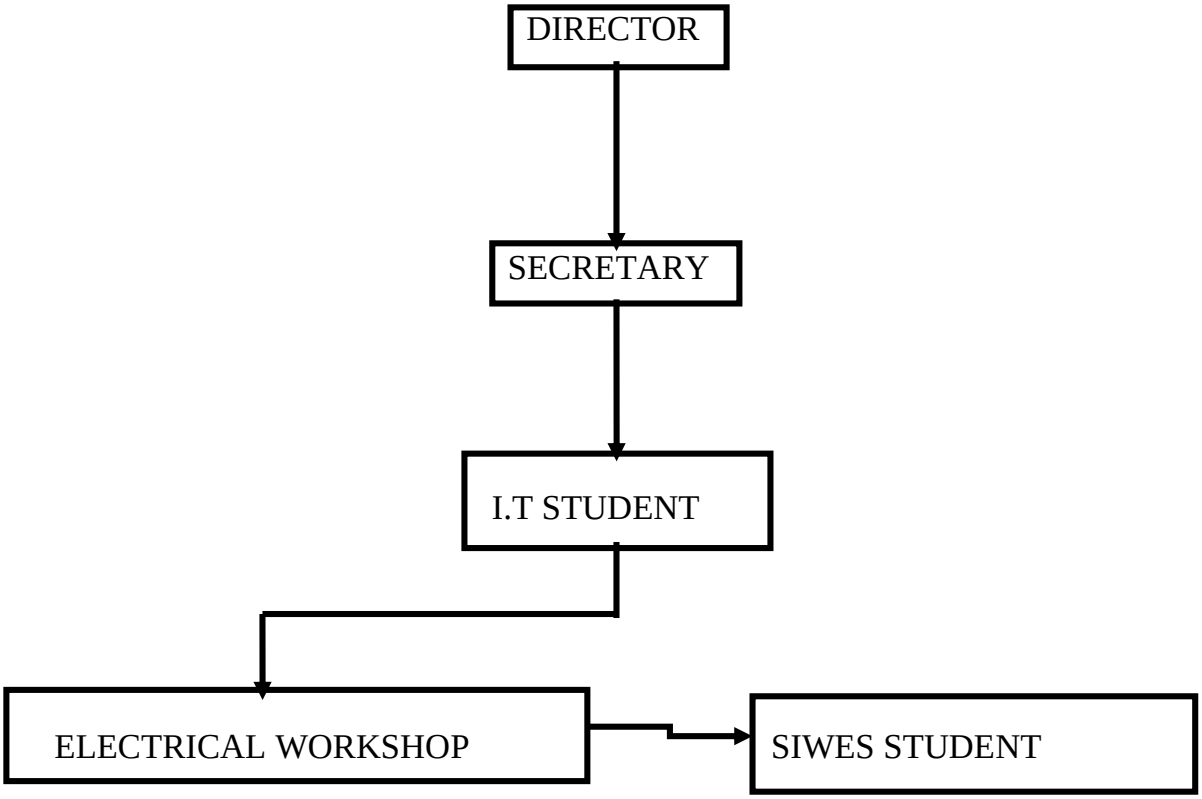
It is aimed at exposing students to machines and equipments, professional work methods and ways of safe-guarding the work area and workers in industries and other organizations. It is funded by the Federal Government of Nigeria and jointly coordinated by the Industrial Training Fund (ITF). This is the Industrial work experience gathered during the period of four (4) months of this scheme (SIWES) is written in this industrial training report.

1.1 Objectives of SIWES

SIWES was established to achieve the following Aims

- Provide an avenue for student to acquire industrial skill and experience of their course of study
- Enables student to develop more affection to their chosen profession.
- Expose student to work method and techniques in handling equipment
- Provide students the opportunity to apply their theoretical knowledge in real work situation thereby bringing gap between polytechnics works and their actual practice.
- Prepare student for work situation they likely to meet after graduation.
- To introduce training students to industrial atmosphere and discipline
- To provides opportunity for the trainee students to apply knowledge obtained in form of lectures and practical to industrial reality
- To provide an opportunity for the trainee students to access their own suitability for careers they have chosen.

1.2 THE ORGANIZATION CHARTS



CHAPTER TWO

2.0 INTRODUCTION TO SAFETY PRECAUTION

Safety can be defined as the measure to be considered in every working place in other to avoid injury on one self to prevent damage to the equipment or tools in use.

2.1 ELECTRICAL SAFETY

It is important to isolate an electrical appliances or equipment from the power supply and test should be carried out to ensure that all poles of the circuit are working before working on it.

2.2 GENERAL SAFETY RULES AND REGULATION IN THE WORKSHOP

- ✓ Cleanness: It is very important in every workshop to ensure case ventilation.
- ✓ Wearing or overall; Wearing of loose cloth or tie is not allowed in a workshop because they can easily be caught by moving part of machine which can cause injury or terminate the life of the personnel.
- ✓ Keeping of equipment and tools in proper
- ✓ Condition: This ensures long life span of the equipment and tools.
- ✓ Working under supervision of an expert: This lessen the risk exposing oneself to injury and promote better work ability to the personnel.

2.3 THE NECESSARY PRECAUTION IN THE WORKSHOP

- ✓ The workshop environment should be tidy
- ✓ Reading of instruction on machine before operating it to prevent machine breakdown or injury
- ✓ Proper training should be done before working on any machine.
- ✓ Use of installation electrical tools, especially while working on high voltage to prevent hazard
- ✓ Ensure that supply is completely isolated before caring out extension services or correction exercise on the existing installation of a premise.

Advantages of strict adherence to safety rules and regulation

- → Long life of tools and equipment
- → Good workmanship and work ability
- → Total absence from likely danger
- → Ensure conducive environment for working

CHAPTER THREE

3.1 ELECTRICAL TOOLS AND INSTRUMENTS

Electrical engineering departments a department that without working with tools or instrument they can't have a good work on the field and electrical engineering make use of different instruments in performing different operations in their field.

3.2 PART OF THE TOOLS USED ARE

- Pliers
- Hammer
- Tester
- Hack saw
- Safety belt
- Cutting pliers
- Screw driver
- Bending spring
- Gloves

3.3 USES OF THE ABOVE TOOLS AND INSTRUMENTS

- **Pliers:** it is used for cutting disconnecting or removing installation material like rubber from a conductors, it is also used to hold material firmly in order to couple the material together.
- **Hammer:** it is used for clipping cables to a surface
- **Tester:** it is used to check whether a conductor is alive, and also used to detect the flow of current in a conductor.

- **Hack saw:** It is used for cutting metal and PVC pipe when working on conduit wiring system.
- **Safety belt:** for preventing and holding the body when climbing concrete poles.
- **Cutting pliers:** for cutting conductors
- **Screw driver:** it is used for loosing and tightening screw.
- **Bending spring:** it's made up of spring, it is used in bending PVC piple when working on a conduit wiring systems
- **Gloves:** it is used to guide against electrical and mechanical damages to the body

PLIER

HAMMER

NEON TESTER

HACK SAW

SCREW DRIVER

CHAPTER FOUR

4.0 SOLAR PANEL AND GENERAL ELECTRICAL INSTALLATION

4.1.1 SOLAR PANEL

Solar energy is one of the ways of producing clean electricity for domestic usage. The solar system technology relies on photovoltaic cells to convert sunlight into electrical energy (electricity).

Solar Panels

4.1.2 TYPES OF SOLAR PANEL

1. **Mono-crystalline**: Mono-crystalline are solar panels made entirely of a single crystal structure. These crystals are usually made of silicon fabricated into bars and cut into wafers. The mono-crystalline solar panels are usually dark in colour.
2. **Poly-Crystalline:** This type of solar panel is manufactured by melting the crystal of silicon and the crystals of other elements together to form waters. These elements may be copper (c), indium (i), gallium, melted together with silicon to form copper indium gallumselenide (CGIS).

The accessories used for solar panel installation include:

1. Aluminum solar rack
2. Bolt and nut
3. Nail
4. Connecting wires
5. Building wires.

4.1.3 FACTORS CONSIDERED WHEN INSTALLING SOLAR PANEL

The factors considered before the installation of solar panels include:

1. **Location:** In order to achieve an optimal energy, the solar panels must be placed such that they face the direction of the sun path and not either the sunrise or sunset.
2. **Season:** The best season to use solar energy is summer (dry season). This is because, solar panel receives more ultra-violet ray of sunlight during the period.
3. **Climate:** The brightest day allow solar rays to be more efficient but drastically decreases when the sky is overcast.
4. **Shade:** the solar panels should be installed in a position where there is no shade. Any shade on the solar panels reduces the efficiency of the solar array.

4.1.4 INSTALLATION OF SOLAR PANEL

During solar panel installation, the Azimuth angle must be taken into consideration. The Azimuth angle is the angle of south direction and the vertical plane of the square solar cell.

The two ways in which solar panels are installed are:

1. **Rooftop Installation:** In this type of Installation, the solar panels are installed on the roof of building. Solar mounting racks or angle bar irons are used to attach or nail the panel to the rooftop in order to prevent it from being carried off by the wind.

Rooftop Installation of Solar Energy

2. **Ground Mount or Standalone Installation:** Here, the panels are installed on special made and design supports made of steel or irons. These steels are conjoined to form installation racks capable of carrying heavy weights.

The two common connection types of photovoltaic (PV) system are:

1. The system is connected to utility grid with battery storage to generate power needed for consumption.
2. The system is connected to battery to provide emergency power back up. After installation of the solar panels, using any of the above two stated ways, the photovoltaic (PV) cells are connected to an inverter system which comes with an inbuilt charger controller to help control and monitor the charging of the set of batteries connected in either series connection or parallel connection or inter series and parallel connection. This inverter also helps transforms the DC power generated by these batteries to an AC power for consumption or emergency back up. This power output conversion is due to the fact that home appliances make use of AC power supply and not DC.

Storage Battery

4.2.1 GENERAL ELECTRICAL INSTALLATION

In electrical wiring, a circuitry of wires is formed in a building through channels by employing appropriate and loop and mesh technique.

During my industrial training, I learnt that there are two kinds of wiring namely:

1. **Surface Wiring:** Here, the wires are clipped on to the surface of walls while performing the wiring connection. Not only the wires are clipped to the walls,

other components like the junction box, portrait box, etc are also nailed onto the walls of the building. This is the most cheapest type of wiring.

2. **Conduit Wiring:** Conduit refers to the channels where electrical wires run through and acts like a protection to the electrical wires. The conduit wiring is of two types. There are: Half-Conduit and Full Conduit.

- Half Conduit is most employed in bungalows and it is less costly than Full-Conduit.
- The full conduit wiring is always employed in storey buildings and it is the most costly of all electrical wiring.

In conduit wiring, pipes are used as the channels which forms the name conduit. Wires are run through this pipes after which the pipes having been buried in the walls of the buildings. The pipes are channelled to the distribution board (DB) from every switching and socketting points of the building.

4.2.2 PROCEDURES FOR CONDUIT WIRING

- Walls cracking
- Pipes are buried in the walls and sealed with cements together with appropriate components like track out box, DB, troll box, etc.
- Wiring is done using phishing type to pull the wires through and from all points to the DB.

The wires are connected in the Distribution Board (DB) such that the breakers in the DB control certain points or rooms.

4.2.3 TOOLS/COMPONENTS NEEDED FOR WIRING

- Hammer
- Screw drivers
- Distribution Board
- Junction Box (used for surface wiring)
- Y-box, I-box, U-box, etc.
- Tape, Phishing tape
- Plier
- Cutout

- Changer over switch
- Chiesel
- Pipes s
- Wires, Cables, etc.

It should be noted that, for efficient performance of the wiring in a building, special cables are used for certain points where large loads are to be used, to avoid undue breakdown of the installation always. Such points and cable types include:

- AC unit – 6.0mm to 10.0mm.
- Water Heater Unit – 6.0mm to 10.0mm
- Cooker Unit – 6.0mm to 10.0mm
- Normal or General Socket Units – 2.00mm to 2.5mm
- Lighting Units – 1.0mm to 1.5mm
- From cutout to Control – 10.0mm

A Switch Gear ***Distribution Box***

EXPERIENCE GAINED

During the student industrial work experience scheme (SIWES) period I was deeply exposed to electrical engineering aspect unlike before I am unable to recognize any of electrical tools, but after the programmed. I can now work with most of instrument being mention. Some of the electrical work that I don't know before but during my SIWES training I was shown, with this little experience being gained in the

organization especially the electrical installation. I can now work successfully on my own.

INVOLVEMENT AT THE SECTION/UNIT

With respect to the Industrial Training fund (ITF) programmed. I have acquired more knowledge and view on the diverse engineering fields in which I have learnt more about the practical application of electrical engineering.

While I was in the organization I was working with the staff of the **BASH *NIGERIA-ELECTRICITY MANAGEMENT AGENCY*** at No 20, Oke Andi Ilorin, Kwara State I was involved in the electrical installation.

CHAPTER FIVE

5.0 CONCLUSION

The experience gained within the four months of the SIWES programme remains one of the great experience that had impacted knowledge, skills and attitude in the field of electrical and electronics engineering.

It had enhanced my knowledge about the theoretical and practical ability, through the industrial training; I was able to achieve the objectives of student industrial work experience scheme. (SIWES).

In fact, it really boosts my knowledge and made me to be brace in the field, at electrical and electronics engineering.

5.1 RECOMMENDATION

SIWES programmed is often enormous important, in exposing student to technical activities in order to attain a sound knowledge required to become professionals in their respective field of course of study.

Personally the SIWES programmed has given me the opportunity to combine both theoretical and practical knowledge of engineering and technology, in a meaningful way to solve series of problems such as installation, repairing and maintenance of some electrical devices.

In this regard I will implore all SIWES student to take this programme very serious and ensure they do it in a place where relevant to their respective field, as it will be of great opportunity for them both in the school and outside the school.