CHAPTER ONE

1.0 INTRODUCTION

The Students Industrial Work Experience Scheme (SIWES) is a Skills Training Programmed designed to expose and prepare students of Universities, Polytechnics/Colleges of Technology/Colleges of Agriculture and Colleges of Education for the Industrial Work situation they are likely to meet after graduation.

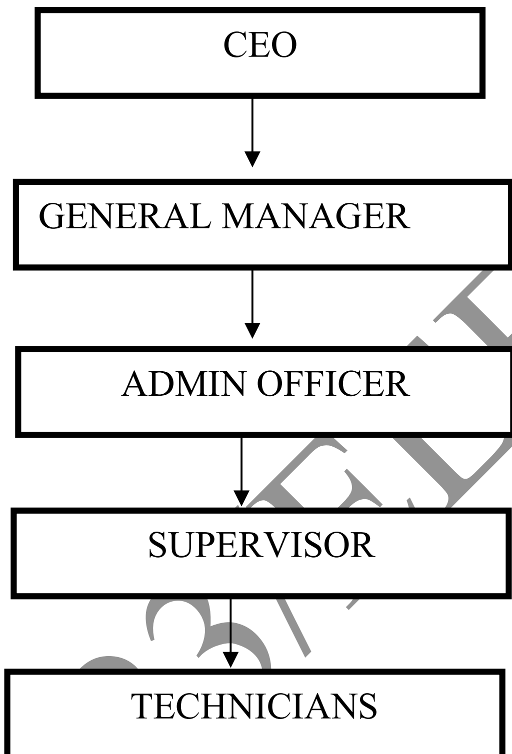
The scheme also gives students the opportunity of familiarizing and exposing themselves to the needed experience in handling equipment and machinery that are usually not available in their Institutions. Before the establishment of the scheme, there was a growing concern among our Industrialists that graduates of our Institutions of higher learning lacked adequate practical background studies preparatory for employment in Industries. Thus, the employers were of the opinion that the theoretical education going on in higher institutions was not responsive to the needs of the employers of labour. It is against this background that the rationale for initiating and designing the scheme by the Fund during its formative years 1973/74 was introduced to acquaint students with the skills of handling employer's equipment and machinery. The ITF solely funded the scheme during its formative years. But as the financial involvement became unbearable to the Fund, it withdrew from the Scheme in 1978. The Federal Government handed over the scheme in 1979 to both the National Universities Commission (NUC) and the National Board for Technical Education (NBTE). Later the Federal Government in November 1984 reverted the management and implementation of the SIWES Programme to ITF and it was effectively taken over by the Industrial Training Fund in July 1985 with the funding being solely borne by the Federal Government.

1.1 GOALS AND OBJECTIVES OF SIWES

1. To enhance the knowledge of students (theory) of what they have been taught in school by backing it with enough practical
2. To provide students the opportunity to apply their theoretical knowledge to practical work situation whereby it bridge the gap between the theory works in the class and the practical works in the site.

3. To provide an avenue for students to acquire industrial skill and experience in their course of study.
4. To enable students to develop more affection for their chosen profession.
5. To expose students to working method and technique in handling equipment and machineries that may not be available to them in school.

1.2 ORGANIZATION CHART



CHAPTER TWO

2.0 BRIEF HISTORY OF THE COMPANY

Hadbuq Disbabim Investment Limited located at no 70 Adabata Road Ilorin, Kwara State was established to provide electrical installation, maintenance, and repair services. Over the years, it has grown into a trusted company specializing in all electrical service. With a focus on safety and efficiency, the company continues to deliver reliable electrical solutions to various sectors.

2.1 INTRODUCTION TO ELECTRICAL TOOLS

Electrical tools are essential for installing, repairing, and maintaining electrical systems. These tools help ensure precision, efficiency, and safety when working with electrical components. Each tool has a specific function, ranging from cutting and stripping wires to measuring electrical values and securing installations.

2.1 COMMON ELECTRICAL TOOLS AND THEIR USES

1. Pliers: Used for gripping, twisting, bending, and cutting wires. Types include long-nose pliers for reaching tight spaces, diagonal pliers for cutting, and combination pliers for multiple functions.

Screwdrivers: Essential for tightening and loosening screws in electrical connections. Flat-head and Phillips screwdrivers are the most commonly used, while insulated screwdrivers provide additional safety when working with live circuits.

2. Hand Drill & Drill Machine: Used for drilling holes to mount electrical fixtures, install conduit pipes, and create passages for wiring. Electric drill machines allow for faster and more precise drilling compared to manual drills.

3. Ammeter: Measures electric current flow in a circuit, helping to diagnose faults and ensure proper current levels.

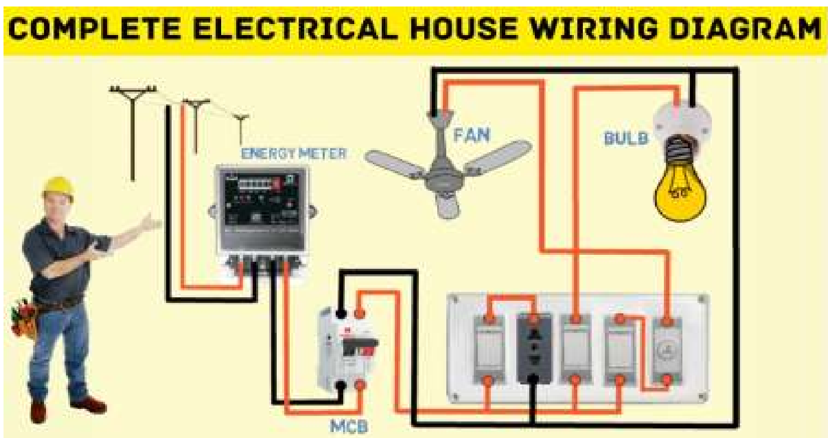
4. Multimeter: A versatile tool that measures voltage, current, and resistance. It is used for troubleshooting electrical faults in wiring and devices.

5. Tester (Voltage Tester): A simple device used to detect the presence of voltage in wires, sockets, and electrical panels. It helps in identifying live and neutral connections safely.

6. Multiplier: Used in measuring electrical resistance and current adjustments in circuits, often in combination with measuring devices like voltmeters.
7. Tapes (Insulation Tape & Measuring Tape): Insulation tape is used to cover exposed wires and prevent electric shocks, while measuring tape ensures accuracy in electrical installations.

2.2 ELECTRICAL WIRING AND INSTALLATIONS

Electrical wiring and installation involve the proper arrangement of electrical cables, devices, and components to ensure the safe and efficient distribution of electricity. It is a critical aspect of electrical work, covering tasks such as installing lamp holders, switches, sockets, circuit breakers, and cutouts.



2.2.1 TYPES OF ELECTRICAL WIRING

1. Surface Wiring: In this method, electrical wires are placed on the surface of walls or ceilings using clips or conduit pipes for protection. It is commonly used in residential and commercial buildings.
2. Conduit Wiring: Electrical cables are routed inside PVC or metal conduit pipes for added protection, making it suitable for industrial environments.
3. Concealed Wiring: Wires are hidden inside walls, floors, or ceilings, providing a clean and aesthetic look, mostly used in modern buildings.

2.2.2 INSTALLATION PROCESS

The installation process begins with planning the electrical layout, identifying positions for switches, sockets, and lighting points. Next, appropriate wire sizes are selected based on the electrical load requirements. For example, 1.5mm² wires are used for lighting, while 2.5mm² wires are suitable for socket outlets.

After laying the wires, electrical components such as lamp holders, switches, sockets, and circuit breakers are fixed. The final step is testing the wiring system to ensure proper connectivity, voltage levels, and safety compliance.

2.3 ELECTRICAL EQUIPMENT REPAIR AND MAINTENANCE

Electrical equipment repair and maintenance are essential to ensure the proper functioning, safety, and longevity of electrical devices. Regular servicing helps prevent faults, power failures, and hazards caused by worn-out or damaged components.

Common Electrical Equipment Repaired

1. Household Appliances: Repairs are done on irons, blenders, hotplates, and voltage stabilizers, which often develop faults due to damaged wiring, faulty heating elements, or worn-out motors.
2. Generators: Maintenance includes rewinding generator coils, replacing faulty brushes, and fixing fuel or electrical issues to restore efficiency.
3. Lighting Systems: Faulty lamp holders, street lights, rope lights, and security lights are repaired or replaced to ensure proper illumination.
4. Pumping Machines: Repairs involve rewinding coils, fixing electrical control boxes, and checking wiring connection s for smooth operation.

2.4 ELECTRICAL POLE AND STREET LIGHT INSTALLATION

Electrical pole and street light installation are essential for power distribution and public lighting. Proper installation ensures safe, efficient, and reliable electricity supply to streets, residential areas, and commercial spaces.

Types of Electrical Poles

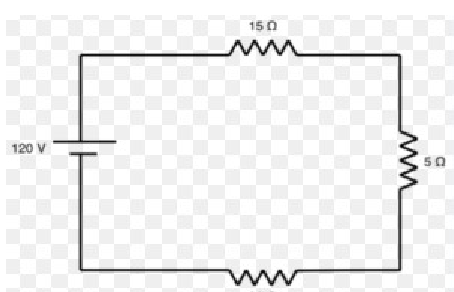
1. Single-Phase Poles: Used in areas where power demand low is required, such as homes and small businesses.
2. Three-Phase Poles: Suitable for areas with higher electricity demand, including industries and commercial zones.

2.5 CONNECTION OF ELECTRICAL COMPONENTS

Electrical connections are essential for ensuring proper power flow, safety, and functionality in electrical systems. The process involves linking electrical components such as switches, sockets, circuit breakers, and lighting fixtures to a power source.

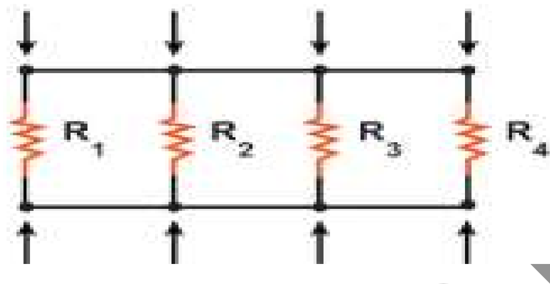
2.5.1 TYPES OF ELECTRICAL CONNECTIONS

1. Series Connection: Components are connected end-to-end, allowing current to flow through one path. If one component fails, the entire circuit is disrupted.



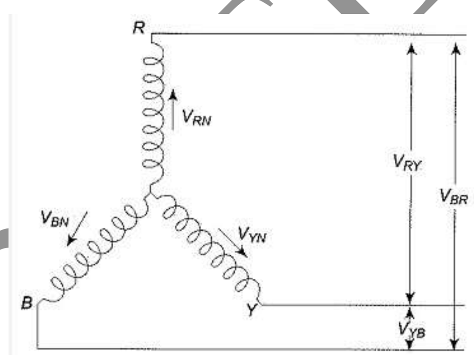
Series Connection

3. Parallel Connection: Each component is connected directly to the power source, allowing independent operation. If one component fails, others continue functioning.

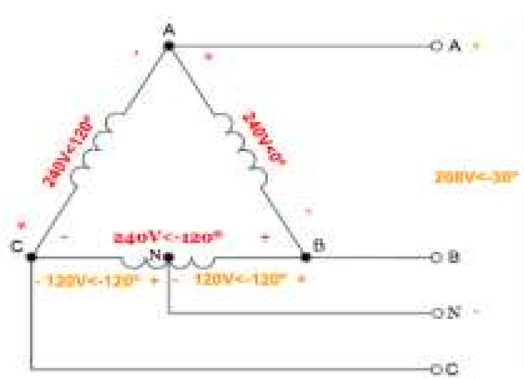


Parallel Connection

4. Star Connection: Common in three-phase systems, where each phase is connected to a common neutral point, providing balanced voltage distribution.



5. Delta Connection: Used in high-power industrial applications, where each phase is connected in a closed loop, eliminating the need for a neutral wire.



CHAPTER THREE

3.0 PRACTICAL WORK DONE

3.1 FIXING OF ELECTRICAL COMPONENTS AND WIRING

During the training, several electrical components were installed and connected to ensure efficient power distribution. The installation of lamp holders, switches, sockets, and cutouts was carried out in various locations. Proper wiring connections were made using appropriate cable sizes, ensuring that lighting and power outlets functioned correctly. The process included testing and verifying the continuity of circuits using a multimeter and tester to confirm that electrical connections were secure. Any faulty wiring or loose connections were rectified to prevent future malfunctions or electrical hazards.

3.2 INSTALLATION OF ELECTRICAL POLES AND STREET LIGHTS

Street lighting and electrical pole installations were essential tasks performed during the training. Single-phase and three-phase poles were erected at designated locations, ensuring proper alignment and stability. The installation process involved digging pole holes, mounting poles, and securing them with concrete to withstand environmental conditions. After pole installation, street lights were mounted and connected to the power supply. Electrical cables were properly laid and insulated to prevent short circuits. The installed street lights were tested to ensure they provided adequate illumination, contributing to public safety and security.

3.3 REPAIR AND MAINTENANCE OF ELECTRICAL APPLIANCES

Several faulty electrical appliances were diagnosed and repaired during the training. Common repairs included fixing blenders, irons, and hotplates, which often had damaged heating elements or broken wiring. The automatic voltage stabilizer was also repaired by troubleshooting faulty components and replacing damaged parts to restore its functionality.

3.4 TESTING, TROUBLESHOOTING, AND SAFETY INSPECTIONS

Proper testing and troubleshooting were conducted to ensure electrical systems operated safely and efficiently. Security lights, circuit breakers, and pumping machines were inspected for faults. Loose connections, voltage irregularities, and insulation defects were identified and corrected.

The safety inspection process included checking proper earthing, wiring insulation, and circuit protection devices to prevent electrical hazards. The use of safety tools and PPE (Personal Protective Equipment) such as insulated gloves and safety boots was strictly followed during testing procedures.

CHAPTER FOUR

4.0 CHALLENGES ENCOUNTERED AND LESSONS LEARNED

4.1 CHALLENGES ENCOUNTERED

During the training, several challenges were encountered while performing electrical tasks. One major challenge was the lack of adequate tools and equipment, which sometimes slowed down the troubleshooting and repair process. In some cases, alternative tools had to be used, requiring extra effort and precision. Another challenge was dealing with faulty electrical components, especially in appliances like blenders, stabilizers, and generators. Diagnosing the root cause of failures required extensive testing and analysis, particularly when handling complex circuits.

Additionally, weather conditions affected outdoor installations such as pole and street light mounting, making work difficult, especially in rainy conditions. Working in confined spaces while rewiring electrical circuits in buildings also posed challenges in accessibility and maneuverability.

4.2 LESSONS LEARNED

Despite the challenges, the training provided valuable hands-on experience that improved practical knowledge and problem-solving skills. One key lesson learned was the importance of safety precautions in electrical work. Strict adherence to safety measures, such as wearing insulated gloves, safety boots, and using proper tools, helped prevent electrical hazards. The training also enhanced understanding of fault tracing techniques, allowing for faster identification and resolution of electrical problems. Using testing instruments like multimeters and ammeters became an essential skill in diagnosing circuit faults.

Furthermore, the experience emphasized the importance of teamwork and communication when handling electrical installations and repairs. Coordinating with team members improved efficiency and ensured that tasks were completed accurately and on time.

Overall, the training bridged the gap between theoretical knowledge and practical applications, providing a strong foundation for professional development in the electrical field.

CHAPTER FIVE

5.0 RECOMMENDATIONS AND CONCLUSION

5.1 RECOMMENDATIONS

Based on the training experience, several recommendations can be made to improve future industrial training programs:

1. Provision of Adequate Tools and Equipment: Industries and training centers should ensure that trainees have access to the necessary electrical tools and testing instruments to enhance efficiency in troubleshooting and repairs.
2. More Practical Exposure: Training should involve more hands-on sessions with complex electrical installations and repairs to further improve technical skills.
3. Safety Awareness and Training: Regular workshops on electrical safety should be conducted to reinforce the importance of using protective gear.
4. Regular Maintenance of Electrical Systems: Organizations should schedule routine maintenance for electrical installations to prevent sudden failures and ensure system reliability.

5.2 CONCLUSION

The industrial training was a highly beneficial experience, bridging the gap between theoretical knowledge and real-world applications. It provided valuable exposure to electrical installations, fault tracing, troubleshooting, and equipment maintenance. Despite the challenges faced, the experience gained has contributed significantly to technical skill development, problem-solving abilities, and safety awareness. The training has laid a strong foundation for future careers in the electrical field, emphasizing the importance of precision, efficiency, and teamwork in professional practice.