A TECHNICAL REPORT
STUDENT INDUSTRIAL WORKING EXPERIENCE SCHEME
(SIWES)

Held at
MINISTRY OF WORK AND ENERGY

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DEDICATION

I dedicate this technical report to the Almighty Allah, the giver of knowledge, the beneficent and the merciful for his protection and provision throughout this SIWES programme.

ACKNOWLEDGEMENT

I'm using this opportunity to express my profound gratitude and deep regards to the creator of heaven and earth, the one who knows the beginning and the end, the Almighty Allah and also to my guardian (MR & MRS. ADEBISI), and to all those who has helped me during my SIWES programme. The blessings, help and guidance given by them, time to time has carry me so this far and shall carry on the journey of life on which I am about to embark. I 'm using this opportunity to express a deep sense of gratitude to compliment my mentors for their cordial support valuable information and guidance which helped me in completing my SIWES through various stages.

Lastly my deep regard to the best and most inspiring siblings.

A big thanks goes to my friends, May Almighty Allah bless, protect and guide you through all your life's entire journey. And also my regard to the school board of trustees and the staff a very big thank you to all.

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CHAPTER ONE

1.1 INTRODUCTION TO STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME

The student's industrial work experience scheme (SIWES) is a skill training programme designed to expose and prepare students of Universities, Polytechnics, Colleges of Technology\Colleges of Agriculture and Colleges of Education for industrial work situations they are likely to meet after graduation. The scheme also affords students the opportunity of familiarizing and exposing themselves to the needed experience in handling equipment and machinery that are usually not available in the institutions. It is a cooperative industrial internship program that involves institutions of higher learning, industries, the Federal Government of Nigeria, Industrial Training Fund (ITF), and Nigerian Universities Commission (NUC).

The student's industrial work experience scheme (SIWES) was initiated in 1973 by the industrial training fund (ITF). This is in response to the mandate given to the ITF, through decree 47 of 1971, charging it with the responsibility of promoting and encouraging the acquisition of skills in industry and commerce with the view to generating a pool of trained indigenous manpower sufficient to meet the needs of the economy.
SIWES has come to be recognized as the major avenue of bridging the gap between the theory acquired by student of tertiary institutions and to the various professions and disciplines essential to the technological and economic development of Nigeria. The scheme has, over the years contributed immensely to the personal development and motivation of students to be able to understand the important connection between the taught and learnt content of their academic programs and what knowledge and skills will be expected of them in professional practice after graduation.

More so, SIWES is a program designed by ITF to prepare students for the challenges they will face in their respective fields when they become part of the nation's workforce. Furthermore, ITF through SIWES, aims at ensuring that Universities and Polytechnics do

not produce “half-baked graduates” that will not be useful industrially because of their inability to relate the theoretical knowledge acquired to the necessary industrial practice.

Over the years, SIWES has contributed immensely to building the common pool of technical and allied skills available to the Nigerian Economy which is needed for the nation’s industrial development. These contributions and achievements have been possible because of regular innovations and improvements in the modalities employed for the management of the scheme. In view of acquired industrial skill, the Federal University of Agriculture, Abeokuta (FUNAAB) has made it compulsory for all students to undergo the Students Industrial Work Experience Scheme (SIWES). Therefore, Universities and Polytechnics now produce graduates with a great wealth of experience.

1.2 HISTORY OF SIWES

The SIWES program was introduced in Nigeria in 1973 by the Industrial Training Fund (ITF) to address the growing concern about the lack of practical skills among graduates. The scheme was created in collaboration with the Nigerian Universities Commission (NUC), the National Board for Technical Education (NBTE), and the National Commission for Colleges of Education (NCCE). Over the years, SIWES has evolved to become a critical component of tertiary education in Nigeria, ensuring that students are well-prepared for the demands of the labor market.

The Students’ Industrial Work Experience Scheme (SIWES) was initiated in 1973 by the Federal Government of Nigeria under the Industrial Training Fund (ITF) to bridge the gap between theory and practice among products of our tertiary Institutions. It was designed to provide practical training that will expose and prepare students of Universities, Polytechnics, and Colleges of Education for work situation they are likely to meet after graduation.

Before the establishment of the scheme, there was a growing concern among the industrialists that graduates of 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.

As a result of the increasing number of students' enrolment in higher institutions of learning, the administration of this function of funding the scheme became enormous, hence ITF withdrew from the scheme in 1978 and was taken over by the Federal Government and handed to National Universities commission (NUC), National Board for Technical Education (NBTE) and National Commission for Colleges of Education (NCCE). In 1984, the Federal Government reverted back to ITF which took over the scheme officially in 1985 with funding provided by the Federal Government

1.2 OBJECTIVES OF STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME

- To provide an avenue for students in the training to acquire industrial skills and experience in their course of study..
- To expose students to the practical aspect of their discipline, thereby enhance creativity and skills in them.
- To teach students the techniques and methods of working with facilities and equipments that may not be available within the walls of an educational institution.
- To make students learn how to manage work environment and increase their interactive skills will colleagues, subordinates, superiors and clients.
- To provide students with an opportunity to apply their knowledge in real work situation, thereby bridging the gap between theory and practice.

1.4. OBJECTIVES OF ESTABLISHMENT

The establishment of SIWES was driven by the need to:

- Address the gap between academic training and industry requirements.
- Produce graduates who are not only theoretically sound but also practically competent.
- Promote collaboration between educational institutions and industries.
- Enhance the quality of education by integrating practical training into the curriculum.
- Contribute to national development by producing a skilled workforce capable of driving innovation and economic growth.
- To maintain good relationship with patients, relations and the community through health education.
- To carry out diagnosis and intervention.
- To provide training for students.
- To maintain sufficient hospital supply of equipment and promote their utilization and maintenance.

CHAPTER TWO

2.1. BENEFIT DERIVED FROM SIWES PROGRAMME

The experience, knowledge, skills and exposure acquired during the period of attachment in the industrial exercise cannot be over emphasized. I was exposed to certain areas in my course of study, such as:

1. **Skill Development**: Students acquire practical skills and competencies that are essential for their professional growth.
2. **Industry Exposure**: The program provides students with firsthand experience of industrial operations, processes, and technologies.
3. **Networking Opportunities**: Students interact with professionals in their field, building valuable connections for future career prospects.
4. **Enhanced Employability**: Employers prefer candidates with practical experience, making SIWES participants more competitive in the job market.
5. **Improved Academic Performance**: The application of theoretical knowledge in realworld scenarios enhances students' understanding of their coursework.
6. **Contribution to National Development**: By producing a skilled workforce, SIWES contributes to the economic and technological advancement of the nation.

2.2 OVERVIEW OF THE MINISTRY OF WORK AND ENERGY

The Ministry of Work and Energy is a government agency responsible for the formulation and implementation of policies related to energy production, distribution, and utilization. The ministry plays a critical role in ensuring the availability and reliability of electricity supply across the country. One of its key functions is the procurement and distribution of electrical equipment, such as transformers and appliances, to support infrastructure development and maintenance.

The Ministry of Work and Energy operates under a hierarchical structure, with the Minister at the top, followed by Directors, Departmental Heads, and various units. The procurement and supply chain management department falls under the Directorate of Operations and is responsible for sourcing, purchasing, and distributing electrical equipment.

2.3 ORGANIZATIONAL CHART OF THE ORGANIZATION

Minister of Work and Energy

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Director of Operations

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Procurement and Supply Chain Management Department

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Procurement Unit

Inventory Unit

Logistics Unit

Functions and Responsibilities

The ministry is tasked with:

- Formulating and implementing energy policies.
- Ensuring the availability and reliability of electricity supply.
- Procuring and distributing transformers and electricity appliances.
- Maintaining infrastructure and equipment.
- Collaborating with stakeholders to achieve energy sector goals.

2.4 PROCUREMENT AND SUPPLY CHAIN MANAGEMENT IN THE MINISTRY

Procurement Process

The procurement process in the ministry follows a structured approach:

- Needs Assessment: Identifying the requirement for transformers and appliances.
- Vendor Selection: Evaluating suppliers based on quality, cost, and delivery time.
- Purchase Order Issuance: Formalizing the agreement with the selected vendor.
- Delivery and Inspection: Receiving and inspecting goods to ensure compliance with specifications.
- Payment Processing: Approving and disbursing payments to vendors.

Procurement Flowchart:

Needs Assessment → Vendor Selection → Purchase Order → Delivery & Inspection → Payment Processing

Supply Chain Management

The supply chain management process involves:

Coordinating with suppliers to ensure timely delivery.

Managing logistics for the transportation of goods.

Monitoring inventory levels to prevent stockouts or overstocking.

Supply Chain Diagram:

Supplier → Procurement Department → Inventory Management → Distribution to Project Sites

Inventory Management

The ministry uses an inventory management system to track stock levels, monitor usage, and reorder supplies when necessary. This system ensures that transformers and appliances are available when needed, minimizing delays in project execution.

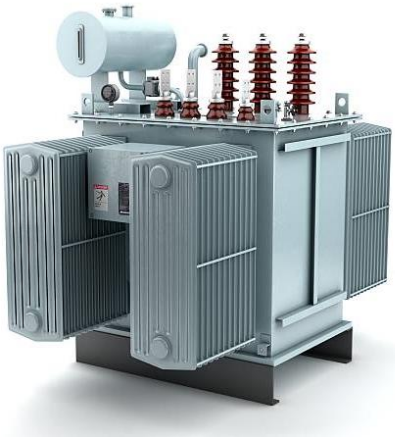
In the Ministry of Energy, various apparatus and equipment are used to support the generation, transmission, distribution, and management of energy resources. Below is a list of common apparatus used in the ministry and their respective uses:

2.5 INTRODUCTION TO APPARATUS AND THEIR FUNCTIONS

1. Transformers

Use: Transformers are used to step up or step down voltage levels in electrical power systems. They ensure efficient transmission of electricity over long distances and safe distribution to endusers.

Types: Power transformers, distribution transformers, and instrument transformers.



2. Electricity Meters

Use: Electricity meters measure the amount of electrical energy consumed by residential, commercial, and industrial customers. They are essential for billing and monitoring energy usage.

Types: Analog meters, digital meters, and smart meters.

3. Circuit Breakers

Use: Circuit breakers protect electrical circuits from damage caused by overloads or short circuits. They automatically interrupt current flow when a fault is detected.

Types: Air circuit breakers, oil circuit breakers, and vacuum circuit breakers.

4. Generators

Use: Generators convert mechanical energy into electrical energy. They are used as backup power sources during outages or in areas without access to the main power grid.

Types: Diesel generators, gas turbines, and renewable energy generators (e.g., solar, wind).

5. Switchgear

Use: Switchgear controls, protects, and isolates electrical equipment. It ensures the safe operation of power systems by managing the flow of electricity.

Types: Lowvoltage switchgear, mediumvoltage switchgear, and highvoltage switchgear.

6. Capacitors

Use: Capacitors store electrical energy and improve power factor in electrical systems. They help reduce energy losses and improve the efficiency of power distribution.

Types: Fixed capacitors and variable capacitors.

7. Insulators

Use: Insulators prevent the flow of electricity to unwanted areas. They are used to support and separate electrical conductors without allowing current to pass through them.

Types: Pin insulators, suspension insulators, and strain insulators.

8. Power Cables

Use: Power cables transmit electrical energy from one point to another. They are used in power distribution networks and underground/overhead installations.

Types: Lowvoltage cables, mediumvoltage cables, and highvoltage cables.

9. Relays

Use: Relays are protective devices that detect faults in electrical systems and trigger circuit breakers to isolate the faulty section. They ensure the safety and reliability of power systems.

Types: Overcurrent relays, differential relays, and distance relays.

10. Energy Storage Systems (Batteries)

Use: Energy storage systems store electrical energy for later use. They are essential for renewable energy systems and backup power solutions.

Types: Leadacid batteries, lithiumion batteries, and flow batteries.

11. Solar Panels

Use: Solar panels convert sunlight into electrical energy through photovoltaic cells. They are used in renewable energy systems to generate clean and sustainable power.

Types: Monocrystalline, polycrystalline, and thinfilm solar panels.

16. Testing and Measurement Equipment

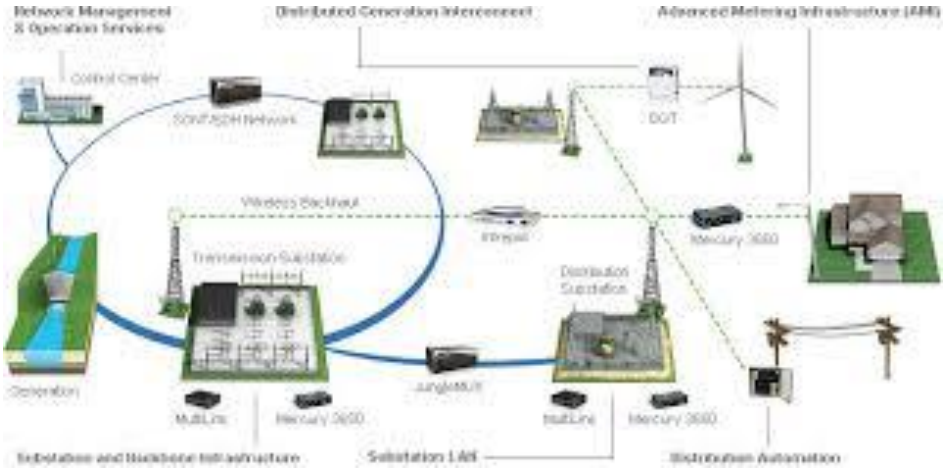
Use: Testing equipment is used to diagnose and troubleshoot electrical systems. Examples include multimeters, clamp meters, and insulation testers.

Types: Digital multimeters, infrared thermometers, and earth resistance testers.

17. Power Line Communication (PLC) Devices

Use: PLC devices enable communication over existing power lines. They are used for remote monitoring and control of energy systems.

Applications: Smart grid communication and automated meter reading.



18. Voltage Regulators

Use: Voltage regulators maintain a constant voltage level in electrical systems. They protect equipment from voltage fluctuations and ensure stable power supply.

Types: Automatic voltage regulators (AVRs) and manual voltage regulators.

19. Earthing and Grounding Equipment

Use: Earthing equipment provides a safe path for electrical faults to dissipate into the ground. It protects personnel and equipment from electric shocks and damage.

Components: Ground rods, earthing mats, and grounding conductors.

CHAPTER THREE

3.1 ROLES AND RESPONSIBILITIES DURING THE TRAINING

During my industrial training, I was actively involved in the following activities:

- Assisting in the preparation of procurement documents, such as purchase requisitions and tender notices.
- Participating in vendor evaluation and selection processes.
- Updating inventory records and tracking stock levels.
- Observing the inspection and testing of transformers and electrical appliances.
- Supporting the logistics team in coordinating the delivery of goods.
- Documenting procurement activities and maintaining accurate records.

3.2 LEARNING EXPERIENCES AND SKILLS ACQUIRED

The training provided me with valuable skills and knowledge, including:

- Understanding the procurement cycle and its importance in organizational operations.
- Developing skills in vendor management and negotiation.
- Learning how to use inventory management software.
- Gaining practical knowledge of quality assurance processes for electrical equipment.
- Improving communication and teamwork skills through collaboration with colleagues.

3.3 CHALLENGES ENCOUNTERED

Some of the challenges I faced during the training included:

- Delays in the delivery of goods due to logistical issues.
- Difficulty in understanding technical specifications of electrical equipment initially.
- Limited access to certain procurement documents due to confidentiality.
- Balancing multiple tasks and meeting deadlines.

3.4 PROCUREMENT AND SUPPLY CHAIN MANAGEMENT IN THE MINISTRY

The procurement and supply chain management department is responsible for:

- Sourcing and purchasing highquality transformers and electricity appliances.
- Managing supplier relationships and negotiating contracts.
- Ensuring timely delivery of goods to various project sites.
- Maintaining an efficient inventory system to track stock levels.
- Conducting quality checks on procured items to ensure compliance with standards.

4.1 SUMMARY OF EXPERIENCE

My SIWES attachment at the organization provided me with a comprehensive understanding of procurement and supply chain management. I gained practical skills in inventory management, vendor negotiation, and supply chain optimization, which will be invaluable in my future career.

During my training, I observed that the ministry uses a structured procurement process, which includes needs assessment, vendor selection, purchase order issuance, and delivery monitoring.

4.2 CONCLUSION

My SIWES experience at the Ministry of Work and Energy was both enlightening and rewarding. It provided me with a deeper understanding of procurement and supply chain management processes, particularly in the context of selling transformers and electricity appliances. The skills and knowledge I acquired during this training will undoubtedly

The SIWES program has been a transformative experience, equipping me with the knowledge and skills required to excel in the field of procurement and supply chain management. The exposure to real-world challenges and solutions has prepared me for the demands of the professional world.

I was able to apply the theoretical knowledge gained in the classroom to real-world scenarios. The program enhanced my understanding of procurement processes, inventory management, supplier relationship management, logistics, and compliance. It also equipped me with essential skills such as problem-solving, communication, and teamwork, which are critical for success in the procurement and supply chain industry.

4.3 RECOMMENDATIONS

To improve the efficiency of the procurement and supply chain management process, I recommend the following:

- Implementing advanced inventory management systems to enhance tracking and stock control.
- Providing regular training for staff on the latest procurement practices and technologies.
- Establishing stronger relationships with reliable suppliers to minimize delays.
- Ensuring proper documentation and transparency in all procurement activities.

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