
**A TECHNICAL REPORT**

**ON**

**STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)**

**UNDERTAKEN AT**

**HENRYSTECH ELECTRICAL/ELECTRONICS ENGINEERING WORLD**

**BY**

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**SUBMITTED TO THE DEPARTMENT OF ELECTRICAL-ELECTRONICS ENGINEERING TECHNOLOGY,**

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**IN PARTIAL FULFILMENT OF AWARD OF ORDINARY NATIONAL DIPLOMA IN THE DEPARTMENT OF ELECTRICAL-ELECTRONICS ENGINEERING TECHNOLOGY**

## DECLERATION

I declare that this technical report of "student industrial work experience scheme (SIWES) is an original work by me under the supervision of Department of Electrical-Electronics Engineering Technology Kwara State Polytechnic, Ilorin.

# DEDICATION

This report is dedicated to God for His enabling strength he bestowed on me, giving me knowledge and understanding with the grace of getting through with the four (4) months Student Industrial Work Experience Scheme (SIWES) training.

This is also dedicated to my parent Mr. and Mrs. AJADI, siblings, friends, and HENRYSTECH ELECTRICAL/ELECTRONICS ENGINEERING WORLD staffs.

## CERTIFICATION

I certify that **AJADI ABIODUN OLUWAGBOGO** of Institute of Technology, Department of Electrical/Electronics Engineering, Kwara State Polytechnic, Ilorin. Carried out is long essay under my supervision.

## ACKNOWLEDGEMENT

I am grateful to God the sole provider of knowledge, Wisdom, Love, Mercy and Grace for his protections on embarking and completing the program.

I also appreciate space and form and their entire of the firm who offered me timely criticism and corrections that led me through the various steps and stages during the program.

I appreciate my parents, Mr. and Mrs. AJADI, My siblings and friends for their unquantifiable love and financial assistance during this period. May God bless us and reap the fruit of our labor.

Moreover, I express my profound gratitude and immense thanks to all my lectures, who are worthy of emulation. I hereby pray to ALMIGHTY GOD to crown their effort with is abundant blessings and continue to elevate their status to the highest position both in like ten and hereafter

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# CHAPTER ONE

## 1.0 INTRODUCTION

The Students Industrial Work Experience Scheme (SIWES) for the 2018/2019 kicked off in the month of August 2019 and was to be concluded six months later, January 2020. The Industrial Attachment program is solely aimed at improving the working skills of students in tertiary institutions as well as effecting learning, participation and observation of the actual implementation of theories put in practice in various fields with respect to programs and courses being studied in school. This scheme serves as an opportunity for students to grasp very useful practical knowledge which not only makes them employable but also in the perfect understanding of theories and operations in their different majors. The program is of very high importance considering the lack of adequate practical materials for learning in most Nigerian tertiary institutions and is self-proven as it has been part and parcel of the country's system of education for over 25 years.

## 1.1 THE HISTORY OF SIWES

SIWES was set up by the Federal Government of Nigeria to close the gap between theoretical laws taught in the classroom and actual practice for students in tertiary institutions. It was first kicked off and funded by the Industrial Training Fund (ITF) between 1973 and 1974. Since its introduction by the ITF in 1973 the scheme has gone through series of reforms. Its management has changed hands from the ITF in 1978 to various regulatory agencies such as National Universities Commission (NUC) and National Board for Technical Education (NBTE) in 1979, National Commission for College of Education (NCCE) and now back to the ITF again in 1985. These are the major stakeholders in (SIWES). Consequently, SIWES Program introduced into the curriculum of tertiary institutions in the

country as far back as 1974 with 748 students from 11 institutions of higher learning and 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 skill will be expected of them on professional practice after graduation.

## 1.2 OBJECTIVES OF SIWES

The Industrial training funds policy document no. 1 of 1973, which established SIWES outline the objectives of the scheme. The objectives are to:

1. Provide an avenue for students in institution of higher learning to acquire industrial skills and experience during the course of study.
2. Prepare students for industrial work situation that they are likely to meet after graduation.
3. Expose students to work methods and techniques in handling equipment and machinery that may not be available in their institutions.
4. Make the transition from school to the world of work carrier and enhances students contacts for later job placements.
5. Provide students with the opportunities to apply their educational knowledge in real work situations, thereby bridging the gap between theory and practical.
6. Enlist and strengthen employer's involvement in the entire educational process of preparing university graduates for employment in industry.

## 1.3 MISSION AND VISION OF SIWES

The vision of SIWES is to prepare students to contribute to the productivity of their nation. Students Industrial Work Experience Scheme has the potential of increasing the scope and variety of technical skills in the common pool or general stock available for the industrial development of Nigeria. Therefore, harnessing the

potentials of SIWES for Industrial, Technological and Economic development however demands that the three major SIWES stakeholders or actors(Students, Institutions, Employers) be empowered to fully participate and cooperate with one another in implementing the scheme.

### 1.3.1 BENEFITS OF INDUSTRIAL TRAINING TO STUDENTS

The major benefits accruing to students who participate conscientiously in industrial training are the skills and competencies they acquire. This is because the knowledge and skill acquired through training by students are internalized, and it becomes relevant, during job performances or functions. Several other benefits include:

1. Opportunity for students to blend theoretical knowledge acquired in the classroom with practical hand-on application of knowledge required to perform work in industry.
2. Exposes students to the working environment, i.e. to enable them see how their professions are organized in practice.
3. Prepare students to contribute to the productivity of their employers and nation’s economy.
4. Provision of an enabling environment where students can develop and enhance personal attributes such as critical thinking, creativity, initiative, resourcefulness leadership, time management, presentation of skills and interpersonal skills.
5. Prepares students for employment and makes transition from school to the work environment easier after graduation.
6. Enables student bridge the gap between the acquired skills in the institution and the relevant production skill required in the work organization.
7. Enables students contact with potential while on training.

# CHAPTER TWO

## 2.0 OVERVIEW OF DA HENRYSTECH ENGINEERING WORLD

Henrystech Electrical/Electronics Engineering World is a leading Electrical/Electronics Engineering company that specializes in designing, and delivering innovative electrical and electronic solutions to various industries. Our team of experienced engineers and technicians work together to provide high-quality services and products that meet the needs of our clients.

## 2.1 **Services**:

1. Design and Development: We offer design and development services for electrical and electronic systems, including circuit design, PCB layout, and firmware development.
2. Testing and Commissioning: Our team provides testing and commissioning services to ensure that electrical and electronic systems are functioning correctly and safely.
3. Maintenance and Repair: We offer maintenance and repair services for electrical and electronic systems, including troubleshooting, replacement, and upgrade of components.
4. Consulting: Our experienced engineers provide consulting services to help clients select the best electrical and electronic solutions for their projects.

## 2.2 **Products**:

1. Electrical Panels: We design and manufacture electrical panels for various industries, including industrial, commercial, and residential.
2. Electronic Devices: Our team develops and manufactures electronic devices, such as control systems, monitoring systems, and communication systems.

3. Power Systems: We offer power systems solutions, including power generation, transmission, and distribution systems.

## 2.3 Industries Served:

1. Commercial: Office buildings, shopping centers, hotels, and restaurants.
2. Residential: Homes, apartments, and condominiums.
3. Aerospace and Defense: Military, aviation, and space exploration.

## 2.4 Mission Statement:

Our mission is to provide innovative electrical and electronic solutions that meet the needs of our clients, while maintaining the highest standards of quality, safety, and customer service.

## 2.5 Vision Statement:

Our vision is to be the leading Electrical/Electronics Engineering company in the industry, recognized for our expertise, innovation, and commitment to customer satisfaction.

# CHAPTER THREE

## 3.0 INVOLVEMENT, WORK DONE AND EXPERIENCE GAINED

It was truly a great experience working for three months at Henrystech Electrical/Electronics. The system permitted me to alternate between different engineering working departments after some weeks. This has greatly improved my general perception of what Engineering and quite particularly Electrical Engineering is all about. My involvement and participation are detailed below.

- Industrial Installations and Wiring.
- Maintenance and Repairs of Work Tools and Electrical Machines.

## 3.1 INDUSTRIAL INSTALLATIONS AND WIRING

This is the networking system or arrangement of cables for the free flow of current in a circuit.

**Types of Wiring Includes:**

1. **Conduit Wiring:** This is the process where electric cables are arranged systematically in a wall through the use of PVC pipe in order to transfer energy from one point to another in a circuit.
2. **Cleat Wiring:** This is a system of wiring done in an industry with the help of a cleat chip made of different types of groove.

**INTEGRITY TEST:** This is the process of testing completed electrical installations to verify that the system will operate efficiently and safely. The tests are extensive, as defined in the institution of Electrical Engineers regulations. They can only be carried out by a competent person, i.e. a qualified electrician or Electrical Engineer. This tests are undertaken by visual inspection and the use of a multi-meter to measure the resistance.

**The following tests are an essential part of the processing:**

1. **Dead Test:** This is the process of testing completed installations without power supply. The aim is to test the continuity to ensure integrity of the live, neutral and the earth conductors without bridging (short circuit). Testing the insulation to ensure that there is a high resistance between live, neutral and earth conductors. Testing polarity to ensure all switches and breakers are connected to phase, live conductors.
2. **Live Test:** This is the process of testing completed installation with power supply. The aim is to know the load that is connected to each circuit, each phase and entire 415V that is supplied. During this test for earth loop to know the effectiveness of the installation earthing system.

## 3.2 MAINTENANCE AND REPAIRS OF MACHINES

During my industrial training at MCC, I was involved in many maintenance and routine checks.

Some of the work maintenance I was involved in was:

- **Electric Concrete Vibrators**

  A concrete vibrator is a mechanical device to generate vibrations. The vibration is often generated by an electric motor with an unbalanced mass on its driveshaft. Concrete vibrator consolidate freshly poured concrete so that trapped air and excess water released and the concrete settles firmly in place in the formwork. Improper consolidation of concrete can cause product defects, compromise the concrete strength, and produce surface blemishes such as bug holes and honeycombing. An internal concrete vibrator is a steel cylinder about the size of the handle of a baseball bat, with a hose or electrical cord attached to one end. The vibrator head is immersed in the wet concrete.

**Three-Phase Electric Motor**

A three phase motor has two main parts: the rotor, which turns, and the stator that turns it. The rotor is often called a squirrel cage because it consists of a circular network of bars and rings that look a bit like a cage connected to an

axle. The stator consists of a ring with three pairs of coils, evenly spaced around the rotor.

Each pair of coils is attached to one phase of power. Because they are all out of phase with each other, they set up a rotating magnetic field that spins around the stator at a continuous rate. The moving magnetic field creates a continuing moving current inside the rotor. This current always lags slightly behind the field in the stator.

Three-phase motors are designed to run on the three-phase alternating current(AC) power in many industrial applications such as Batching Plants.

Rewinding completed for a 3-phase. 6HP, 415V, 50Hz Electric Motor.

## 3.3 BATCHING PLANT INSTALLATION, OPERATIONS AND MAINTENANCE

### Operation/ working of concrete batching plant

Working principle of concrete batching plant is dependent on five primary functions:

- **Aggregate feeding:** Aggregates and sand have to be fed into the individual feeder bins.
- **Powder feeding:** Powder here refers to cement, fly ash and additives. These are important components for binding of material.
- **Water:** Water will help cement bind evenly with aggregate. Specific quantity of water is must for any ready mix.
- **Storage and Conveyance:** Storage and conveyance here refer to storage of cement, fly ash, etc. They have to hold up quantity in bulk and transfer small quantity by screw conveyor to the weighing hoppers.
- **Control System:** Control system is very critical for any advanced machine. It makes operation fast and accurate.

Concrete batching plant process flow will start from feeding of aggregates into individual bins. Size wise aggregates have to be fed into individual bins. These aggregates will be weighed individually as per design set in the control panel.

After weighing they will be transferred to the mixing unit. Above the mixing unit there are weigh hoppers for cement, additive and water. The job of the weigh hopper is to weigh and then transfer the contents into the mixing unit below. Cement is transferred to the weigh hopper by means of screw conveyor. Water is pumped up into the weigh hopper. After mixing for a specific time as set in the mixing unit, the mixer will discharge the contents into the transit mixer or a concrete pump.

All the above processes are carried out carefully and systematically. Each process is carried for a specific time frame. The time frame starting from the weighing of aggregates to the discharge of the ready mix material is known as batch time.

# CHAPTER FOUR

## 4.0 PROBLEMS ENCOUNTERED AND POSSIBLE SOLUTIONS

### 4.1 Problems Encountered

- Unavailability of Project design and Analysis of already started projects.
- Unavailability of companies own Computer system and software for design practice.
- Lack of proper orientation to the staff about my being in the company for SIWES, as some staffs sends me on unnecessary errands.
- Compatibility issues of software version and operating system.

### 4.2 POSSIBLE SOLUTIONS

### FOR PROSPECTIVE INTERNS

1. Prospective interns should begin early in search of companies where they can secure IT placements. This will help them get a place on time.
2. Prospective interns should not secure placements based on amount the company will pay. But should secure placements based on the experience to be gained.

**FOR THE COMPANIES**

1. Henrystech Electrical/Electronics engineering company should try to increase stipends of students on training in their organization to help them ease the burden of transportation and feeding.
2. The company should endeavor to provide materials on theoretical aspects or manuals for students so as to study fully the work that is being done.
3. Constant supervision should be made available for students so as to minimize errors and mistakes.
4. Companies should communicate to staff on the roles of IT students which is to learn and not to be sent on menial errands.

**FOR THE INSTITUTION**

1. The school should assist students in getting SIWES placements.
2. The institution should endeavor to communicate to the companies on the roles and responsibilities of the IT students.

# CHAPTER FIVE

## 5.0 SUMMARY, RECOMMENDATION & CONCLUSION

### 5.1 SUMMARY

The purpose of the SIWES program is to bridge the gap between classroom and the industries so that the student will be prepared for the task ahead after their schooling. So these six (6) months SIWES program has exposed me to real installation and maintenance works, it has also helped in bridging the gap between the classroom and real life practical engineering situations. This industrial training has really given me an insight to the task that lie ahead of me in my chosen career "Electrical/Electronic Engineering". This Industrial Training Report has been aimed to picture the various task that is being carried out in the industry in the field of Electrical/Electronic Engineering, the skill acquired and the challenges on the aspect of Innovation and Creation in order to make the world a comfortable place**.**

### 5.2 RECOMMENDATION

- I will recommend that more Electrical Engineering students be posted to the organization for their SIWES.
- Students should ensure to be posted in time so as to get enough knowledge of what they should learn at their respective workplace.

- The ITF should ensure frequent visit if supervisors to the companies where students are posted so as to ensure students are serious during the duration of their Industrial Training.
- The main essence of the scheme should be made known to the companies, so that students are not assigned to tasks that are not of benefit to his/her career development.

## 5.3 CONCLUSION

The SIWES has positively contributed to my training as a future Electrical/Electronics Engineer. At SIWES workplace i.e., Henrystech Electrical/Electronics World I was able to reconcile theoretical principles learnt in school with real Electrical/Electronic Engineering design practice.

I also learnt about the proper maintenance of electrical power tools, participated in the rewinding and installation of 3-phase Electric Motors, installation of a new Batching Plant. Equipment sizing, preparation of material take-off and bill of quantities.

SIWES gave me the opportunity to learn about good work ethics, good interpersonal and communication skills.

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