TECHNICAL REPORT ON STUDENT INDUSTRIAL WORK EXPERIENNCE SCHEME (SIWES)

UNDERTAKEN AT

SILVERFOIL SOLID STONE LTD, OGUN STATE

BALOGUN AIRAT AYOOLA
ND/23/MPE/FT/0030

SUBMITTED TO THE DEPARTMENT OF MINERAL RESOURCES AND PETROLEUM MANAGEMENT, INSTITUTE OF APPLIED SCIENCES (IAS), KWARA STATE POLYTECHNIC, ILORIN.

IN PARTIAL FULFILLMENT FOR THE REQUIREMENT OF THE AWARD OF NATIONAL DIPLOMA IN MINERAL RESOURCES AND PETROLEUM MANAGEMENT

AUGUST TO NOVEMBER, 2024

CHAPTER ONE

1.1 INTRODUCTION

SIWES was established by Industrial Training Fund (ITF) in 1973 to solve the problem of lack of adequate practical skills preparatory for emploPyment in industrial by Nigerian graduates of tertiary institution.

The scheme exposes student to industry based skills necessary for a smooth transition from the classroom to the world of work. It affords student of tertiary institution the opportunity of being familiarized and exposed to the needed experience in handling machinery and equipment which are usually not available in the educational institution.

Participation in SIWES has become a necessary pre-condition for the award of Diploma and Degree Certificates in specific discipline in most institution of higher learning in the country, in accordance with the education policy of government.

1.2 PURPOSE OF SIWES

In the earlier stage, student are graduating without any technical knowledge or working experience and this makes them to undergo further training after securing an employment. With this reason, student industrial training was established.

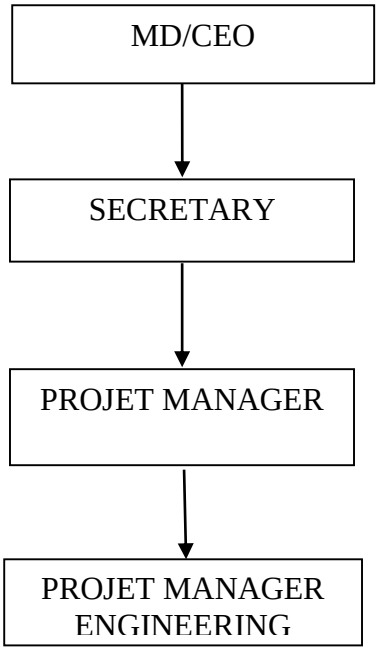
During this programme, as designed by the ITF, student are expected to get technical assistance and acquire more experience scheme in their chosen field of study and exposed them to the usage of source machines and safety precaution where relevant before the completion of their programme in their various institutions.

1.3 AIMS AND OBJECTIVE OF SIWES

1. To provide an avenue for student in the Nigerian Institution to acquire industrial skills and experience during their course of study.
2. To provide student with an opportunity to apply their theoretical knowledge in real work situation thereby bridging the gap between theory and practice.
3. To prepare students for the work situation they are likely to meet after graduation.
3. To expose the student to work method and techniques in handling equipment and machinery that may not be available in their institution.
4. To allow the transition phase from school to the world of working environment easier and facilitate students contact for later job placements.

CHAPTER TWO

2.1 ORGANIZATIONAL CHART OF THE COMPANY



2.2 Precautions in the Mineral Resources and Petroleum Management Laboratory:

1. Always wear a laboratory coat and appropriate personal protective equipment (PPE) when working in the laboratory.
2. Ensure the use of disposable gloves when handling samples or conducting tests.
3. Prohibit eating, drinking, or smoking in the laboratory area.

4. Wash hands thoroughly before and after handling any samples or equipment.
5. Maintain good ventilation in the laboratory to ensure a safe working environment.
6. Handle all laboratory apparatus and equipment with care to prevent damage or contamination.
7. Dispose of all needles and sharp objects in designated sharps containers.
8. All samples must be securely capped and properly labeled for accurate identification.
9. Maintain accurate and organized records of all tests and procedures conducted.
10. Ensure all electrical wiring in the laboratory is properly insulated and maintained.
11. Implement proper waste segregation and disposal procedures according to regulatory guidelines.
12. Keep a functional fire extinguisher readily accessible in the laboratory at all times.

2.3 Some Laboratory Equipment and Their Uses

i. **Core Cutter and Extractor** – Used for sampling and extracting core samples from soil and rock formations.

ii. **Viscometer** – Measures the viscosity of crude oil, drilling fluids, and other petroleum-based substances.

iii. **Petrographic Microscope** – Used for examining and identifying minerals and rock structures in thin sections.

iv. **Muffle Furnace** – Utilized for high-temperature heating processes, such as ash content determination and mineral sample preparation.

v. **Hydraulic Press** – Used to apply pressure to samples for compaction or to prepare thin sections of rocks and minerals.

vi. **Gas Chromatograph** – Analyzes hydrocarbon components in crude oil and petroleum products.

vii. **X-ray Fluorescence (XRF) Spectrometer** – Identifies the elemental composition of mineral and rock samples.

viii. **Centrifuge** – Used for separating mixtures in drilling mud and fluid analysis.

ix. **Bomb Calorimeter** – Determines the calorific value of fuels and other energy materials.

x. **Refractometer** – Measures the refractive index of petroleum products and mineral fluids.

2.4 SAFETY PRECAUTIONS IN THE MINERAL RESOURCES AND PETROLEUM MANAGEMENT LABORATORY

i. Wear appropriate personal protective equipment (PPE), including gloves, safety goggles, and lab coats, while handling chemicals and equipment.

ii. Wash hands thoroughly with soap and water after handling chemicals or removing gloves.

iii. Keep laboratory benches, floors, and workstations clean and free from spills.

iv. Avoid direct skin contact with petroleum products, minerals, and hazardous chemicals.

v. Ensure proper ventilation when working with volatile substances to prevent inhalation of toxic fumes.

vi. Do not store food, beverages, or personal items in the laboratory or near chemical storage areas.

vii. Do not walk around the laboratory with contaminated gloves or footwear.

viii. Eating, drinking, smoking, and application of cosmetics are strictly prohibited in the laboratory.

ix. Dispose of chemical and mineral waste properly according to safety protocols.

x. Report spills, accidents, or unsafe conditions to the laboratory supervisor immediately.

CHAPTER THREE

3.1 USE OF CRUSHING MACHINES

Crushing machines are essential equipment used in the **mining, mineral processing, petroleum, and construction industries** for reducing large rocks, ores, and other solid materials into smaller, manageable sizes. Different types of crushers, such as **jaw crushers, cone crushers, impact crushers, and hammer mills**, are used depending on the material and required output size.

Apparatus

- Crushing machine (e.g., jaw crusher, cone crusher, or hammer mill)
- Protective gloves
- Safety goggles
- Ear protection
- Dust mask
- Hard hat
- Sample material (rock, ore, or mineral)
- Collection tray or container

Procedures

1. **Preparation**
    - Ensure the crushing machine is placed on a stable surface.

- Wear the necessary **Personal Protective Equipment (PPE)**, including gloves, goggles, ear protection, and a dust mask.
- Inspect the machine for any damage, loose parts, or blockages.
- Ensure the power source (electricity or fuel) is properly connected.

2. **Loading the Material**
    - Select the material to be crushed and break it into manageable sizes if necessary.
    - Open the feed hopper or chamber of the crushing machine.
    - Carefully place the material inside the machine, ensuring not to overload it.
3. **Crushing Process**
    - Turn on the machine using the **power switch or control panel**.
    - Adjust the machine settings (if applicable) to control the output size.
    - Allow the crushing machine to process the material until the desired consistency is achieved.
4. **Collection and Inspection**
    - Collect the crushed material in a container or collection tray.
    - Inspect the crushed output to ensure it meets the required specifications.
    - If further size reduction is needed, repeat the process.
5. **Machine Shutdown and Maintenance**

- Turn off the machine after use and disconnect it from the power source.
- Clean the machine thoroughly to remove dust, debris, and remaining material.
- Check for wear and tear on key components like **blades, hammers, or jaws**.
- Lubricate moving parts and store the machine in a safe location.

Notes

- Always follow the **manufacturer's instructions** for safe operation.
- Crushing machines generate noise and dust—**use hearing protection and dust masks** to minimize health risks.
- **Overloading** the crusher can damage internal components and reduce efficiency.
- Regular **inspection and maintenance** ensure longevity and optimal performance of the machine.

3.2 CRUSHING DOWN DOLOMITE STONES

Dolomite is a sedimentary carbonate rock composed mainly of calcium magnesium carbonate ($CaMg(CO_3)_2$). It is widely used in construction,

agriculture, and industrial processes. The crushing of dolomite stones is an essential step in preparing it for further processing, such as grinding or chemical treatment.

Apparatus:

- **Hammer mill or jaw crusher** (for primary crushing)
- **Cone crusher or impact crusher** (for secondary crushing)
- **Sledgehammer** (for manual breaking of large stones)
- **Gloves and safety goggles** (for personal protection)
- **Dust mask** (to prevent inhalation of fine particles)
- **Sieve set** (to classify particle sizes)
- **Weighing balance** (for measuring crushed dolomite)
- **Conveyor belt** (to transport materials)

PROCEDURES:

1. **Safety Precautions:** Wear protective gear (gloves, safety goggles, and dust mask) before starting the crushing process.
2. **Loading the Dolomite Stones:** Place large dolomite stones into the primary crusher (hammer mill or jaw crusher).
3. **Primary Crushing:** The crusher breaks down the dolomite into smaller fragments.

4. **Secondary Crushing:** Transfer the broken dolomite to a cone or impact crusher for further size reduction.
5. **Manual Crushing (if necessary):** Use a sledgehammer to break down oversized pieces that do not fit into the crushers.
6. **Sieving:** Pass the crushed dolomite through a sieve set to classify different particle sizes.
7. **Collection:** Collect the classified dolomite fragments for further processing or use.
8. **Weighing:** Use a balance to measure the required quantity of crushed dolomite.
9. **Cleanup:** Remove dust and debris from the working area to ensure safety and efficiency.

Notes:

- The crushing process increases the surface area of dolomite, making it suitable for applications like cement production, soil conditioning, and metallurgy.
- Proper dust control measures, such as water spraying or air filters, should be used to minimize environmental hazards.
- Different crushers are selected based on the final size requirement of the dolomite.

CHAPTER FOUR

4.1 CONCLUSION

The student industrial work experience scheme (SIWES) helps students to expand their knowledge and experience in their field of study. It will also help student whenever they come across it in future career.

4.2 RECOMMENDATION

I wish the government and the school authority to provide necessary materials for the students during this programme. They should also try to pay the students allowance so as to serve as help for the students in one way or the other.zs

Also, the supervisors should make sure they visit the students in their place's of attachment for proper monitoring, improvement and progress for the benefit of the societies as a whole.