A TECHNICAL REPORT ON STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME

(SIWES)

HELD AT

MA SHA ALLAH AGRO RESOURCES

Along Fate Road, Ilorin, Kwara State

WRITTEN BY

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SUBMITTED TO

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DEDICATION

This report is dedicated to the Almighty God for the gift of life He has given me and also for good health and the useful people He blessed me with during the course of this program.

Also, to my parent for their support in ensuring that I succeed.

ACKNOWLEDGEMENT

All praise, glory, honour and adoration to Almighty GOD, the author and the giver of wisdom, knowledge and understanding for the success of this programme.

I appreciate my parents which are my source to this world Mr. & Mrs. Thaddeus for their parental and spiritual support because without their maximum understanding and support, this experience would have not come into existence including my brother and sister for their support.

At this junction, I must not fail to relay my unalloyed thanks to my school SIWES supervisor, Engr. Aremu Ridwan Mayaki for his moral support, also my HOD and other lecturers in the department. I pray that God will bless and uplift him.

PREFACE

The Student Industrial Work Experience Scheme (SIWES) is a National Diploma Curriculum of the Department of Agricultural Engineering, Kwara State Polytechnic Ilorin.

The programme was established by the Industrial Training Fund (ITF) in 1973 to 1974.

It is designed to acquire the student with life situation in industries as well as supplies in a more practical manner and their knowledge in practical activities and other practical field during their course of study.

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CHAPTER ONE

1.0 INTRODUCTION

Student Industrial Work Experience Scheme (SIWES) was established by the Industrial Training Fund (ITF) in 1973 to solve the problem of lack of adequate practical skills needed for employment in industries by Nigerian graduates or tertiary institution. It is headed by Dr. Mrs. Genzeh

Students' Industrial Work Experience Scheme is a mandatory skill acquisition and training programme. It is designed to expose students to the industrial work place environment in their respective discipline during their course of study.

1.1 MEANING, AIM AND OBJECTIVE OF SIWES

The industrial training funds policy document No 1 of 1973 (ITF 1973) which established SIWES outline the objectives of the scheme. The objectives are to:

- Provide an avenue for student in institution of higher learning to acquire industrial skills and experience during their courses of study.
- Prepare student for industrial work situation that they are likely to meet after graduation.
- Expose student to work methods and technique in handling equipment and machinery that may not be available their institution.
- Make the transition from school to the world of work easily enhance student contact for later job placement.
- Provide students with the opportunity to apply their education knowledge in real work situation, thereby bridging the gap theory and practice.
- Enlist and strengthen employer's involvement in the entire process through SIWES

1.2 A BRIEF SUMMARY OF THE COMPANYS ACTIVITIES

The name of the organization is Ma Sha Allah Agro Resources, Ilorin. It was established in Fate Road alongside within the creation of Kwara State. It was created to perform and has been performing several roles in the development of Agricultural in Kwara State.

Objectives of the organization/ministry

- To render extension services to the farmer
- To render technical service to the farmer
- To improve agricultural activities in the state

- To subsidized the living of tractors to the farmers

1.3 LOCATION OF THE ORGANIZATION

The Ma Sha Allah Agro Resources is located along Fate Road, Ilorin, Kwara State. The organization is basically; the ministry comprises of five (5) departments each having its own directors.

The department includes:

1. Horticulture Department
2. Extension Department
3. Pest and Produce Department
4. Engineering Department
5. Home Economics Department.

CHAPTER TWO

2.0 INTRODUCTION OF THE PROFESSIONAL DEPARTMENT IN THE MINISTRY, THEIR CLASSIFICATION AND PROFESSION

Introduction to the Agricultural Engineering Department in the Ministry, their function, profession and usefulness on the ministry and its contribution to the agricultural welfare of the community.

Agro processing division responsible for the minimizing the post-harvest losses and maximizing of profits, the introduction of machines and technologies to improve harvesting in the farm.

Farm structure and infrastructure division hold and collects all farm structures and silo.

irrigation in charge of all irrigation system

ENGINEERING DIVISION

This division, is a sub-division under Agriculture and Engineering department. It is majority base on irrigation and surveying

They both work hand in hand on how to surveying Facilitates good' selection of the type of irrigation system to be put in place or selected coupled with enhancement of the produce on the farm land.

2.1 IRRIGATION

I was introduced to irrigation. Where I was taught that irrigation is the process by which water is brought to dry land through artificial means such as pipes, holes or ditches. The land is being irrigated usually contains corps, grass or vegetable that would not usually receive enough water from rainfall or other natural resources.

IMPORTANCE OF IRRIGATION

I. It makes food available at all time

2. It makes farmer gain their profit

3. It encourage continuous farmer

TYPES OF IRRIGATION

1. Surface irrigation: This is the process iii which with the farmer dispense water over the land by either flooding it or ruling it down furrows, which are lanes in the field. It is sub-divided further into furrow, border strip or basin irrigation.

2. Furrow irrigation: The application of water Id through the top and of each furrow and flows down the field under influences of gravity, water may be channel using gated

pipe, siphon and head ditch. It is mostly ‘used for broad acre row crops like maize, sugar cane and cotton.

3. Sprinkler irrigation: This is a method in which water thus through Pipes over is on the ground and is then sprayed onto the field.

2.2 AUTOMOBILE UNIT

In this unit, different works were carried out. The works carried out in this unit include – servicing of utility and changing of the track of a bulldozer as reported in my SIWES logbook.

THE TRACTOR

Tractor is an engineering vehicle specifically designs to device a high tractive effort (torque) at low speed, for the purpose of having a trailer or machinery used in agriculture or construction.

At the automobile unit, the workshop manager introduced the tractor to us by giving us a brief lecture on the tractor, he listed the types of tractors which includes:

- The track type tractor,
- The wheel type tractor.

The track type tractors are tractors that uses track for movement. A good example of a track type tractor is the bulldozer.

Tractor parts under normal condition in the machine. Some of the parts needed to check everyday includes; water level at radiator, engine oil level, fuel level and physical properties like tyres, battery terminals etc.

Diagram of a bulldozer

The causes of overheating in tractor:

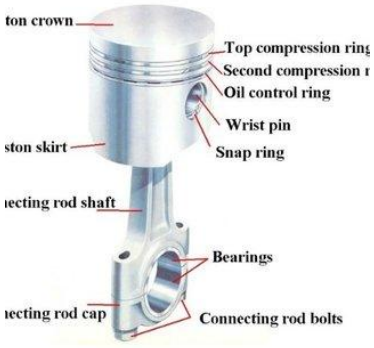
- Low water level
- inefficient water pump cooling fan malfunctioning
- Value clearance on the cylinder.
- Air filter malfunctioning
- Fan belt loose

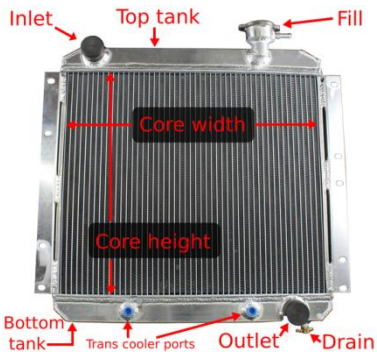
What Causes engine to stop while in operation:

- Fuel or Diesel starvation
- Removed battery terminals
- Chocked air filter
- Electrical fault either alternator not charging or in the battery engine oil level

Operation of Piston

- Inlet
- Compression
- Power stroke (movement of the piston)
- Exhaust





CHAPTER THREE

3.0 MAINTENANCE PRACTICE ON FARM MACHINES, TOOLS AND EQUIPMENTS

This involves servicing repairing replacement of necessary parts of functional check.

Types of Maintenance: Corrective maintenance is the type of maintenance responsible for correction of defects found in machines and equipments

Preventive Maintenance: It is to maintain a level of certain services on equipment and machines

Maintenance of farm implements such as disc plough, mould board, boom sprayer

Daily maintenance: is when you check and verify the condition and tightness of screws and bolts.

Periodic Maintenance: This is done at a regular interval before machine is put to work. This includes cleaning lubricating, replacing of damaged or spoilt parts and retightening of screw and bolt.

Safety Precautions

Precautions to be carried out when using the basic tools in the workshop

i. Always make use of your helmet in the workshop
ii. Using of hand gloves, google, safety boots etc

3.1 DRAINAGE

An agricultural drainage system is a system which water is drained on or in the soil to enhance agricultural production of crops. It may involve combination of storm water control, erosion control ad H^20 table.

Classification of Agricultural Drainage

i. Surface drainage: Surface drainage are applied in relatively flat land that have oil with low
ii. Sub-surface drainage

3.2 EROSION

Erosion is the geological process on earth where materials are wash away and transported by natural faces such as wind or water.

Types of Erosion

- Physical Erosion
- Erosion by water-Erosion by wind, sand dunes
- Splash Erosion

- Sheet Erosion, wind is a powerful agent of erosion
- Rill erosion
- Gully erosion

3.3 REPAIR OF TRACTOR

A complete over handling process of

(i) receiving inspection

(ii) Disassembling

(iii) Visual inspection

(iv) Non-destructure testing

(v) Dimensional inspection

Diagram of a general purpose tractor

During this lecture, he classified the tractor into classes based on their mode of operation, and horsepower.

Some of the parts of a tractor listed include:

- Fan, fan belt, and fan blade
- Steering, steering wheel, steering nut and steering arm
- Water pump
- Power take off P.T.O
- Engine, engine block, engine sump and engine dip stick
- Ignition switch
- Battery
- Transmission gear box, brake, clutch pedal
- Fuel tank
- Exhaust pipe

- Seat
- Tachometer etc

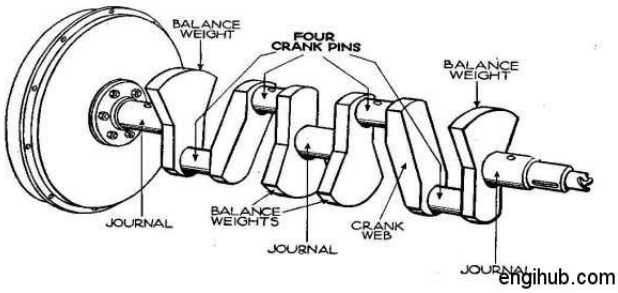
Daily maintenance of tractor

The oil level should be checked regularly and the fuel inside the tank should be checked before starting. The water level in the radiator should be check before operating the tractor. It should be operated at the appropriate speed.

Period maintenance of tractor

1. Servicing of the tractor should be done at regular interval
2. Oil filter should be changed after each service
3. Fuel injectors should be serviced or changed when necessary
4. Fan belt should be adjusted when need be the tractor should be parked in a shed to prevent exposure to unfavorable weather

Valve



Crankshaft

3.4 LIVESTOCK MECHANISATION

It use of mechanical devices to handle all process of livestock. Animal are beneficial for the need of daily food like milk, meat, product and egg.

Range of livestock Housing: Extensive or Pestered system

i. Semi-intensive system
ii. intensive or commercial system
iii. battery cage and deep filter system

Heat regulation: All domestic livestock maintain relatively constant internal temperature at usually within a 1 to 2^{o}c range

Cat Fish Rearing

To raise a fish well, you will need some sickles for digging a pond depending on how big you want

It can be in a container depending on where and how you want raise them parts of a sugar processing machine

i. Conveyor
ii. Inner cylinder
iii. Freezer compressor
iv. Temperature regulator
v. Thermocouple Wire
vi. Electrical panel
vii. Boiler (heater)
viii. Prime mover 1,2,3 etc

3.5 LOW BED

Its usually used to transport or haul heavy equipment and it has the ability to carry load as tall as 3.6meter (12ft). Low bed are usually used to transport a variety of machine equipment.

Maintenance of Low Bed

i. Usually check that there is no lack of gas and also check whether
ii. Pay attention to the suspension system and ensure tightness of all nuts and bolts
iii. There is also need for regular maintenance of the engine

Identification of Tools and Machine Part Tools

i. Spanner
ii. Flat spanner
iii. Bolt
iv. Hand saw
v. Back saw
vi. T-socket spanner
vii. Box spanner
viii. Combination spanner
ix. Nut
x. Plier

Machine part

Crankshaft, Cam shaft, fly wheel, piston, engine block, head gasket, oil pan gasket, distributor, oil filter, cylinder head covers, drain bot, crush washer, cam shaft pulley

3.6 SILO

A silo is a structure for storing bulk materials. Silos are used in agriculture to store grain or fermented feed known as silage. Silos are more commonly used for bulk storage of grain, food products.

Three types of silos are in widespread use today: tower silos, bunker silos, bag silos and silage piles.

USE OF SILO FOR STORAGE OF GRAINS

Basic precaution before the storage of grains

i. Inspection of grains to be stored
ii. Check for IDK (Insect Damage Kernel) so as to avoid grains bee turned into powder by the insects etc

Integrated Pest Management (IPM): To significally reduce the use of pesticide and also managing pest population at an acceptable level to ensure profitability

Monitory Pest Equipment

i. Grain probe trier
ii. Deep bin cup
iii. Grain sieve etc

Protective equipment used during fumigation in a silo and how its used

1. Self contained breathing apparatus (SCBA)
2. Canister
3. Overall etc

3.7 SURVEYING

Surveying can be defined as art and science of making measurement of relative position of natural and manmade feature on the earth surface and presentation of the information in either geographically (as map, plant etc) or numerically (as in locating all value coordinating or bearing).

The used of site investigation by using the measurement survey and table to known the water content of then soil, the surveyor used this instrument in surveying the land

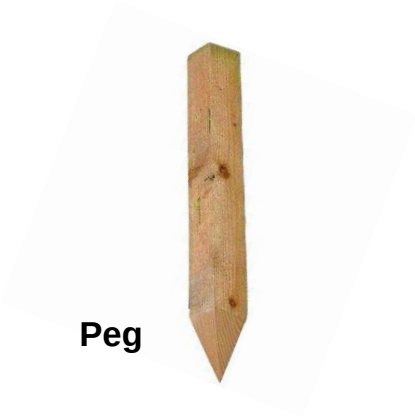
By used

- Theodolite
- Leveling staff
- Instruments
- Peg
- Hammer
- Tape Rule

3.8 CLEARING OF SITE

Remove all the trees, scrubs, roots, vegetation, etc likely to hinder the progress of work on site. The operation was done with the aid of cutlass, diggers, shovel or spade and compressor etc.

Hammer



Peg

Theodolite

Cutlass

Leveling staff

Measuring tape

3.9 THE WELDING UNIT

At the welding unit, I was introduced to welding, its definition, types and the safety precautions in welding.

WELDING

Is a fabrication process that joins metals. That is, welding can be defined as the process of joining metals together. This is often done by melting the work pieces and adding a filler material to form a pool of molten material that cools to become a strong joint.

TYPES OF WELDING

There are two types of welding majorly used in welding operation. These are:

i. Arc welding
ii. Gas welding

Arc welding: Is the type of welding that uses a welding power supply to create an electric arc between an electrode and the base material to melt the metals at the welding point Director (DC) or AC (alternating) current and consumable or non consumable electrodes are majorly used.

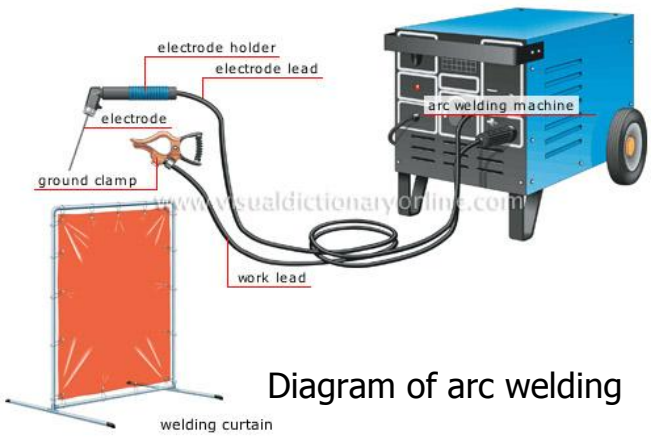


Diagram of arc welding

Gas welding: The gas welding is another type of welding. The common gas welding process is oxyfuel welding, also known as oxyacetylene welding process. Oxyacetylene gas welding is commonly used to permanently join mild

steel. A mixture of oxygen and acetylene gas is used in this process. It has a flame temperature of 3500^0c and it is produced by heating with flame obtained from the combustion of oxygen and acetylene and with or without the use of a filler metal and in this case, no pressure is used.

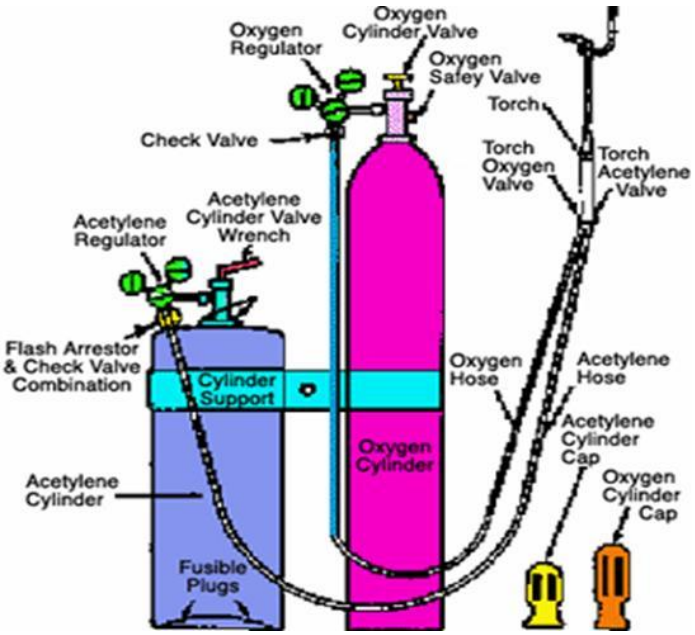


Diagram of gas welding

Some materials used in welding includes: mild steel rod, measuring tape, vernier calipers, cutting machines etc

Safety Precautions Surrounding Welding Operation

Some of the general safety precautions to be taken during welding operations include:

1. Extreme care should be exercised when using any type of welding equipment.
2. Eye protection should always be worn because there is a risk that particles or debris can be blown into the eye.
3. Do not weld in a building with wooden floors unless the floors are protected by means of fire proof materials.
4. Flammable materials such as oil, gasoline, etc should be removed from the vicinity of welding.
5. Proper clothing and safety goggles should be worn before welding

6. Do not leave hot rejected electrodes stubs, steel scrap or tools on the floor.
7. Fix or repair faulty horses, air lines and junction points. A good tip is to shut down all surrounding equipment in the work area and listen for the "hissing" of the air. This will help to identify where the air leak is so the leak can be repaired.
8. Frequently audit the audition of the pump pressure gauges and oil regulators.

CHAPTER FOUR

4.1 EXPERIENCE GAINED DURING SIWES

During this SIWES program, I acquired the practical knowledge of some things I was taught in class thereby, enhancing my knowledge on some machines.

SIWES gave me the privilege to meet older people of different background and of different experiences. I didn't only work with them, I also learnt from them thereby, fulfilling one of the aims and objectives of SIWES.

Through SIWES, I gained the pre-requisite knowledge of changing tracks of a tractor. It is useful as no knowledge gained is lost.

I was also exposed to some machines which I never knew of their existence before SIWES such as the electro hydraulic motor driven tyre changer (for removing tractor tyres). It was only shown to us in the automobile workshop.

4.2 RELEVANCE OF EXPERIENCE GAINED DURING THE SIWES INTREPRENEURSHIP SAILS

Agricultural engineering is a very wide engineering as it cuts across all other engineering. Like one of my lecturers do say "agricultural engineering is a jack of all trade, master of all".

Ministry of Agricultural & Rural Development is one of the government arm established to embark on the development of both surface and underground water resources potential of the nation. The workshop at this organization specializes in the mechanical aspect of agricultural engineering and that was where I was posted in order to gain the mechanical knowledge of agric engineering.

Servicing of automobiles, and repair of automobiles, etc were the major works carried out at the workshop. Though we only participated and were allowed to ask questions, if I decide to further in that field then my SIWES experience will be of great relevance.

CHAPTER FIVE

5.1 IMPRESSION ABOUT THE ORGANIZATION

I see Ministry of Agricultural & Rural Development as an organization that has an achievable goal with people of similar interest working together to achieve this.

I got this impression through the interpersonal relationship among the staff. The understanding amidst the staffs and director is high and worthy of emulation the cooperation in this organization really impressed.

5.2 RECOMMENDATION TO THE POLYTECHNIC

I would like to recommend Ministry of Agricultural & Rural Development to all the students who would like to know about the development of both surface and underground water resources potentials. I also recommend it to students that wish to know the prerequisite of the mechanical aspect of agricultural engineering.

5.3 CONCLUSION

Knowing the practical aspect of engineering makes engineering easier to understand. It also makes engineering worthwhile.

This report contains a large percentage of all the experience I have acquired during my four months' industrial attachment.