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CHAPTER ONE

1.0 General Introduction

The student industrial work experience scheme placement was carried out by polytechnic as per-requisite for award of diploma certificate to produce skilled manpower for speedy development of national economy. In science laboratory and technology is categorized into two aspects. The medical and industrial sections with hematology section which deal with the study of different forms of blood affecting or causing disease.

It is aimed in exposing students to machines and equipment and the way to blend with industrial activities and the safety guarding and effective work in a particular working area. The scheme is a tripartite program involving the student, the polytechnics and the industry.

1.1 Objective of SIWES

My main objective of doing my SIWES attachment is to be able to:

1. To gain practical experience in addition to theoretical knowledge in school.
2. To introduce me to work methods and techniques for handling equipment and machinery that are not available at school.
3. To give me the opportunity to apply my theoretical knowledge in a real-world situation.

1.2 Objective of Establishment

1. to provide patients with personalized care.
2. To develop an understanding of patients' privacy and dignity needs.
3. To maintain good relationship with patient, relationship and the community through health education.

4. To carry out diagnosis and intervention.
5. To provide training for students.
6. To maintain sufficient hospital supply of equipment and promote their utilization and maintenance.
7. To treat and control disease.

1.3 Rules and Regulation of the Laboratory

1. Do not eat inside the laboratory.
2. Always put on your laboratory coat in the laboratory.
3. Do not talk when performing test.
4. Always wear hand gloves when carrying out test.
5. Do not use any equipment unless you are trained and approved as a user by the technologies in charge.
6. Keep the work area clear of all materials except those needed for your work.
7. Do not engage in childish antics such as horseplay or pranks.
8. Clean up your area before leaving the laboratory.
9. Cover up your wound because infection.
10. Wash hands before leaving the laboratory and before eating.

CHAPTER TWO

2.0 EXPERIENCE AND ASSESSMENT

2.1 WATER TREATMENT

Water treatment is a process designed to remove colors, odors, turbidity as well as bacteria and other contaminants.

By nature, water is known to be pure as it is composed of strongly bonded atoms of hydrogen and oxygen. However the water supply across the globe has to share space with other things such as organic materials, minerals, chemicals and manmade pollution. This brings about undrinkable solution, since it can contain deadly bacteria and viruses among other disease causing agents.

The process of treating water may have slight difference at various locations based on the plant's technology as well as the type of water that needs to be treated. The following section talks about standard process of water treatments;

2.1.1 COAGULATION/FLOCCULATION

Coagulation is the addition of liquid aluminum sulfate or alum and polymer to raw or untreated water. The resulting mixture causes the dirt particles in the water to stick together. Then, the group of dirt particles attached together forming larger particles named floc that can easily be removed via filtration or setting.

2.1.2 SEDIMENTATION

When water and floc undergo the treatment process, they go into sedimentation basins. There, water moves slowly, making the heavy flocs particles settle to the bottom. Floc, that accumulates on the bottom is known as “sludge”. This is carried on to the drying lagoons. Direct filtration does not include the sedimentation step and the floc is just removed by filtration.

2.1.3 FILTRATION

In filtration, water passes through a filter, which is made to take away particles from the water.

Such filters are composed of gravel and sand or sometimes called anthracite. This process gathers together impurities that float on water and boosts the effectiveness of disinfection. This process is regularly cleared by means of backwashing.

2.1.4 DISINFECTION

Before water goes into the distribution system, it is disinfected to get rid of disease causing bacteria, parasites and viruses. Chlorine is also applied since it is very effective.

2.2 WATER TREATMENT PLANT

2.2.1 DESCRIPTION OF SYSTEM

The water treatment plant is made up of three integrated treatment system

- Raw water pretreatment
- Make up water treatment
- Waste water treatment

These systems are designed to meet

1. Boiler feed water(make up water)
2. Steam purity
3. ALZD requirements

2.2.2 RAW WATER PRE-TREATMENT

The raw water pretreatment plant is designed majorly for solids removals from the incoming Hanover County sewage effluent, backwash water and waste water from the oily water collection system. Raw water enters a coagulation chamber followed by a clarifier and dual media depth filters.

2.2.3 MAKE UP WATER TREATMENT

Treated raw water is mixed with portable water and pumped to the boiler feed water treatment system. This system is designed to remove 99% of the dissolved minerals and provide high purity water to the boiler. The mixed water flows through a reversed osmosis plant operating at a recovery of 80% and an average salt rejection of 95%. This process is used to remove carbon dioxide and a mixed bed demineralizer.

2.3 HOW CHLORINE IS USED TO TREAT WATER

Chlorination is the process of adding chlorine to drinking water to disinfect it and kill germs. Different processes can be used to achieve safe levels of chlorine in drinking water. It is achievable as compressed elemental gas, sodium hypochlorite solution (NaOCl). The chemical could be harmful in high doses when they are added to water. Chlorination is the best way to provide safe water to the end users. Chlorine kills pathogens such as bacteria and viruses by breaking the chemical bonds in their molecules. Disinfectants that are used for this purpose consist of chlorine compounds which can exchange atoms with other compounds such as enzymes in the bacteria and other cells. When enzymes come in contact with chlorine, one or more of the hydrogen atoms in the molecule are replaced by chlorine. When chlorine is added to water, it forms; $\text{Cl}_2 + \text{H}_2\text{O} \rightarrow \text{HOCl} + \text{H}^+ + \text{Cl}^-$

2.3.1 TYPES OF CHLORINE USED IN WATER TREATMENT

A. Chlorine gas

- ☐ It is greenish yellow in color and heavier than air
- ☐ Its high toxicity makes it an excellent substance for drinking
- ☐ It is a respiratory irritant
- ☐ When used to treat water, it becomes harmless

- ☐ it is the least expensive form of chlorine

B. Chlorine Hypochlorite

- ☐ It is a white solid with a bad odor
- ☐ It must not be stored near wood, cloth or petroleum products
- ☐ It increases the pH of the water being treated.

C. Sodium Hypochlorite

- ☐ It is recognized as household bleach
- ☐ It is light yellow liquid that has a short shelf life
- ☐ It requires a lower concentration to treat water

Addition of chlorine during water treatment is summarized into 4 parts which are as follows:

- a) Pre-chlorination of raw water
- b) Addition of various points in the treatment process
- c) Addition during distribution, and
- d) Miscellaneous use during maintenance activities

2.3.2 USES AND BENEFITS OF CHLORINE CHEMISTRY

- a) Chlorine chemistry helps keep drinking water and swimming pools safe
- b) Chlorine chemistry is used to manufacture household bleaches/disinfectants
- c) Chlorine chemistry helps provide safe and abundant food by protecting crops from pests
- d) Chlorine chemistry plays an important role in energy and environment
- e) It is used in advanced technologies
- f) Building and constructions
- g) Defense and law enforcement i.e. in building bullet resistance vests
- h) Transportations i.e. trains and automobiles

2.4 PRODUCTION ROOM PRECAUTIONS

There are basic rules and regulations that must be followed while working in the production room to avoid dangers or any accidents. And these are grouped into different categories which includes: Hand washing techniques, personal protective and machinery safety.

2.5 HAND WASHING TECHNIQUE

- I. Wet hands and apply liquid hand washer
- II. Clean fingers, fingernails and thumbs
- III. Rinse with clean water

2.6 PERSONAL PROTECTIVE ACTIONS

- I. Laboratory/production hat must be worn whenever we are in the production room
- II. Reagents label must be read properly before using it
- III. Never eat or drink or smoke in the production room
- IV. Covered footwear (white preferably) must be worn at all times

CHAPTER THREE

3.0 DEFINITION OF TERMS

3.1 PRODUCTION EQUIPMENTS AND THEIR USES

1. ROW:- This is a material in form of foils put into the machine to package the sachet water
2. DINGLI MACHINE: This is the machine used in the production of only sachet water
3. RESERVOIR: This is where water are being kept until production is needed. And it must be kept neat at all times. It is called PVC water tanks (Black color preferably)
4. SUBMERSIVE WATER PUMPING MACHINE: This is usually installed deep down in the ground. It is used for pumping water from the underground
5. SURFACE PUMPING MACHINE: This is usually not inside the ground but on the surface. It is also used for pumping water from the underground
6. AERATION FAUCETS:
7. PVC PIPES AND PUMBING FITTINGS: This is used for transmission of water from one facet to another
8. SHORT STOOLS OR CHAIRS: This are used for sitting. It could either be plastic or steel.

Note: Understand the operating procedures of a machine before using it or have a guide.

CHAPTER FOUR

4.0 SUMMARY, CONCLUSION AND RECOMMENDATION

4.1 SUMMARY

During this period, I was well trained on how I can manage a pure water factory to an extent, how to operate some of the machines, the depth of a borehole for water, production management, different chemicals used in water production, and lot more

4.2 CONCLUSION

In conclusion, there were many things that I have experience and learnt during this period. The whole training period was very interesting, instructive and challenging. Through this training, I was able to gain new insights and more comprehensive understanding about the real industry working condition and practice. It has also provided me the opportunities to develop and improve myself in this field. All of this valuable experience and knowledge that I have gained were not only acquired through the direct involvement in task given but also through other aspect of the training such as work observation, interaction with colleagues, superior, and other people related to the field. From what I have undergone, I am very sure that the industrial training program has achieved its entire primary objectives. It's also the best way to prepare students to face the real life task that will surely surface after academic activities. As a result of the program now I am more confident to build my future career which I have already started.

4.3 RECOMMENDATION

Based on my experience during the industrial training I hereby recommend the following:

- The institution should assist in securing placement for students by liaising with established organization.

- The institution should improve coordination during the SIWES program to help assess the quality of training undergone by the students.
- This kind of program should be conducted often to expose students to the working experience or condition of the broadcast industry.
- The student's supervisor from the institution should try to visit the student regularly during the industrial training.
- The student should endeavor to stop truancy towards work and improve their relationship with the employees and their co-workers to make out the best during the training program.
- Lastly I will also like recommend that this program should continue and future participants should develop more attitudes towards the programme because it helps one develop more interest in his or her discipline.