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CONCEPTUALIZATION OF NEW INDUSTRIES AND HEALTH

BY

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(93/4090)

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DEDICATION

I am dedicating this research project to my beloved mother Mrs C.A. Durosaro for her unmeasurable care and assistance. And above all to Almighty God for his mercy and protection over me.

ACKNOWLEDGEMENT

My earnest gratitude to Almighty God for his divine grace enablement and strength given to me in the course of the programme.

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ABSTRACT

This study was carried out to investigate the attitude of Nigeria Industries towards the implementation of existing health and safety guidelines and legislation. Two industries were used namely: Elf Oil Nigeria Limited and West African Milk Company (WAMCO), it is expected that results of the finding will form the bases during conceptualisation of new industry.

Investigation revealed that there was a high degree of awareness on the part of the industries, with WAMCO having the best implementation programmes for safety legislation seems to be inadequate. This could be due to the fact they were adopted from foreign legislation without proper review and conditioning to suit Nigeria standards. Enforcement on the part of the Government on health and safety measures is lacking.

Since there are some degree of laxity in some industries pertaining to health and safety, Government should pay more attention to enforcement of the legislation by providing efficient factory inspectors.

APPROVAL PAGE

This project has been read and approved as meeting the requirement of the Department of Chemical Engineering in the school of Engineering and Engineering Technology, Federal University of Technology, Minna for the award of Bachelor of Engineering (B.Eng.) degree in Chemical Engineering.

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CHAPTER ONE

1.0 INTRODUCTION

Each year throughout the world, millions of industrial accidents occur. These accidents occur sometimes due to explosions, falls, falling objects, misuse of machine tools, electrocution, dust explosion and fire. Some of these accidents were fatal or resulted in temporary/permanent disability. These accidents may also cause extensive damage to property such as buildings and equipment. An accident irrespective of the magnitude wastes time and money and is one of the greatest problem known to man.

Due to the significant role of environmental conditions on human life and the increasing damage of industrialization in form of health hazards arising from modern technology and the imbalance created in nature due to the exploitation of natural resources for the benefit of man, global emphasis is now being placed on environmental protection.

The development of more sophisticated and powerful machinery in industries has necessitated adapting new processes of production and enhanced working environment. It should be realized that great expenditure on account of technology advancement to increase productivity will fail to achieve it's desired aim if the working environment is not adapted to the operator.

The main objective of technology advance is to increase efficiency, optional and effective performance of man and machine, lack of physical injury and psychological well being of the workers. It should also be noted that the working atmosphere is becoming more and more removed from that of natural living condition. There are the problem of extreme temperature, following the use of heat or cold conditions for treatment of materials, nose and vibration, speed and weight of the machine of machines the development of dangerous gasses and dust as a result of the various materials used.

These industries are all situated in the western region of the country.

1.3 HYPOTHESIS

The following suppositions will be used as a basis for reasoning on the problem of industrial health and safety.

a. The economic conditions of an industry will depict the level of health and safety measures.

b. A safe and healthy work environment results from effective legislations and efficient safety officials.

c. Increased accident rates reduces productivity.

d. The type of industry depicts the health and safety measure to be carried out.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 CONTROL OF HAZARDOUS SUBSTANCES AND ACCIDENT PREVENTION.

In general the use of substances likely to be harmful to employees is covered by regulations issued by the government under the "Factories Ordinance 1955" the principal set of regulations in force specify the minimum standards of safety, health and welfare for factory workers.

These regulations should be more concerned with preventive aspects of health and safety, therefore the prevention's are then as follows.

i. SUBSTITUTION

This involves the changing of the processing route to one's using less hazardous materials substitution of toxic process material with non-toxic or less toxic processing materials.

ii. CONTAINMENT

This involves the sound design of equipment and pipes to avoid leaks and disasters for example specifying welded joints in preference to gasketed flanged joints (Liable to leak).

iii. VENTILATION

This is the encouragement of use of open structures or the provision of adequate ventilation system.

iv. DISPOSAL

This is concerned with the provision of effective vent stacks to disperse materials vented from pressure from relief devices (use of vent scrubber) and also proper waste management.

v. **EMERGENCY EQUIPMENT**

This is the provision of escape routes, rescue equipment, respirators, safety showers and eye baths.

vi **TRAINING**

This is the encouragement of adequate practical instructions for personnel especially new ones on safety matters.

Vii **PERSONAL PROTECTIVE EQUIPMENT**

This involves the provision of personal protective equipment such as overalls, caps, goggles, masks, gloves, aprons, and safety shoes. These protective equipment should be synonymous with the hazards involved in that particular industry.

Viii **ENVIRONMETAL MONITORING**

Industries should be encouraged to check exposure levels and consider the installation of permanent instruments filled with alarm.

ix. **HEALTH MONITORING**

This involves the encouragement of regular medical examination on employees, to check for the chronic effects of toxic materials or the effect of their work environment on them.

Although it is important for these legislation to consider mainly the preventive aspect, it is also equally important for it to cover cases of accidents and this comes under the "Workmen's Compensation Ordinance, 1990".

Finally it should be mandatory for industries to carry out insurance in case of accidents so as to be able to cover the cast of compensation of victims as well as repair of equipment or plant.

2.2 OCCUPATIONAL HEALTH AND SAFETY LAWS

TYPE OF LEGISLATION

This flexibility in rule making differentiate some legislation from others. Britain and France occupy the two ends of that spectrum in rule making, to the extent that other

countries could be said to follow either example. However some other countries occupy the middle spectrum.

i. **BRITISH EXAMPLE**

The laws do not preoccupy themselves with much circumstantial details, but rather aims to shape altitudes. These legislations specify responsibility in form of mandatory standard, which are supplemented by codes of practices and guidance notes.

The code of practice offers practical guidance on the ways of achieving the mandatory standard and objectives which the guidance notes are more detailed and provide advice, recommendations and technical information to assist employers and workers in achieving the required levels of health and safety consistent with any relevant legislation. They may not have any legal status but they can be taken to be illustrative of the types of action required to comply with particular regulations or parent legislation.

ii. **FRENCH EXAMPLE**

The laws take the form of detailed regulations, full of technical provisions often supplemented by circular letters or directives for their application.

iii. **OTHER EXAMPLE**

Some countries alternate in their legislation between general principles and detailed provision.

The type of rule being used is important from the point of view of enforcement, the more technical knowledge of enforcement authority the more constructive the act of legislature and the less the inspector has discretionary responsibility.

2.2.1 LEGISLATION IN NIGERIA

One may wonder which of the examples enumerated above the Nigerian legislation comes under. From our legislation enumerated below, it is obvious that ours comes under "other examples" where the legislation alternates between general principle and detailed provisions. These are however complemented with codes of practice and guidance notes. It is right to say that our main legislation on occupational health and

safety (the factories (Amendment Act) 1991 and subsidiary legislation) are a product of the rigidity and circumstantial details of the U.K. Factories Act 1937 and flexibility of the U.K. and safety at work Act 1974. The following are the health and safety laws in Nigeria.

1. **WORKMEN'S COMPENSATION ORDINANCE, 1941**

This ordinance stipulates minimum compensation to be paid in cases of accidents, injuries and death resulting from work exposure. The ordinance has been amended and it is now called Workmen's Compensation Act, 1990.

2. **LABOUR HEALTH AREA REGULATIONS**

These stipulate that when an industry is located more than 30 miles away from a government hospital, adequate facilities must be made available to the workers and their families.

3. **FACTORIES ORDINANCE 1955**

This came to force in 1956. If laid down in general terms what was considered to be minimum standards for the safety, health and welfare of factory workers. The factories (Amendment) Ordinance 1950, which come into operation in 1959, made slight amendment to the original ordinance.

This ordinance was further amended and named the factories (Amended) Decree 1987. The Degree like the Act, laid down minimum standards for safety, health and welfare for factory workers but it contains stiffer penalties for contravention of its provision.

4. **FACTORIES HEALTH PROVISIONS DEGREE 1987**

This becomes factories Act 1990. The Act dealt with lighting, drainage of floors, Sanitary conveniences, removal of dust or fume, meals in certain dangerous trade, protective clothing and appliances, protection of eyes in certain processes, notification and investigation of occupation diseases etc. Contravention of the provision of the Decree draws penalties (fines and imprisonment) of various degrees. Enforcement of the

Health provisions of the factories Decree is the responsibility of the occupational Health branch of the factory inspectorate Department of the Federal Ministry of Labour and Productivity.

5. **FACTORIES (SANITARY ACCOMODATION) REGUALATION, 1957**

These deal with provision and sanitation of convenience in the factories.

6. **FIRST – AID BOXES (PRESCRIBED STANDARDS) ORDER 1958**

This prescribes the provision of First – Aid boxes in the factories.

7. **DECLARATION OF OCCUPATION DISEASE NOTICE 1956**

Work-related diseases like lead poisoning, mercury poisoning, Silicosis etc. Observed in the factories that should request for detailed investigation by the occupation physician.

8. **PUBLIC HEALTH ACT 1958**

This act empowers the medical officers of health to enter all premises including the factories in which mechanical power is not used to ensure general cleanliness of the premises, ensure adequate ventilation, proper drainage of floors and prevent overcrowding. They also carry out the inspection and certification of premises where foodstuff are prepared and stored. The medical officer, through their activities in the factory premises are to assist compliance by the factory to provisions of the factories Decree and subsidiary legislation. The occupation health personnel of the ministry of Health are also to carry out:

i. Pre-employment medical examination of civil servants

ii. Executive health screening

iii. Advisory services on personal health standards

iv. Preparation of draft occupational health standards.

v. Health education of the employees and management

9. NATIONAL POLICY ON THE ENVIRONMENT (FEPA 1989).

This policy just highlight the environmental aspects of the working environment. For example B51 number 19 states that "No industry shall expose and employee to any hazardous condition in his place of work.

Most of these provision are included in the factory(ies) Decree and subsidiary legislation. But the policy sets standard for factories for emission of air pollutants and noise.

2.2.2 LIMITATIONS OF LEGISLATIONS

One major problem with the occupational health and safety legislation is that to a large extent there is disparity between practical possibilities and these statutory obligations. This problem results from the imbibing of advanced foreign legislation from developed countries. Although there is one obvious assistance derived from international law which is that they provide standards, measures and principles with which to evolve an adequate legislation, Nigeria has no comprehensive policy on occupational health and safety. However what exists are specific declarations and objectives which support a vision towards a pragmatic policy.

We must submit that there is yet a wide gap to be filled as regards specific in actions on a comprehensive legislation. The Factories Decree 1987 Demonstrates a parochial vision in terms of its general and specific health safety and welfare provisions and regulations.

The health, safety and welfare should not be restricted to those employed in the factory, for example, page A107 part V number 45 of the Factories Decree 1987 state that " (1) in every factory in which in connection with any process carried on there is given off any dust or fume or other impurity of such a character and to such extent as to be likely to be injurious or offensive to the persons employed, or any substantial quantity of dust of any kid, all practicable measures shall be taken to protect the persons employed against inhalation and to prevent its accumulating in any work soon, and in particular,

where the nature of the process makes it practicable, exhaust appliances shall be provided and maintained, as near as possible to the point of origin of the dust or fume or other impurity so as to prevent it from polluting the air of any workroom" why is there no legislation consideration for the innocent pass by or the neighbouring property that might be adversely affected by dust, fumes of gas emitted from the factory. What Nigeria required in health and safety regulations is not something impressive or high fallible but policy which is strong, purposeful and' action generating and this has been patently absent. Not only is our legislation for health and safety considered short of effective by in many respects are outdated to meet the demands of present time. For example the provisions relating to penalties were stipulated almost a decade age, one of which stipulates a maximum fine of ₦500 or a prison term not exceeding two years. This fine of ₦500 a decade ago might have be adequate but due to high inflation and devaluation of the Naira the present value of the stipulated fine will not amount to much and will not act as a deterrent to the factory owner.

In the International Labour Organisation (I.C.O) original constitution of 1991, Article 41, paragraph 9, it states that " Each country should make provisions for a system of inspection in order to ensure the enforcement of laws and regulations for the protections of the employed. Under this law we are obliged to take appropriate legal action at natural level to implement the policy or objectives of the laws but we are gulty of gross in action in this regards.

2.3 CONCEPTUAL DESIGN STAGE/CONCLUSION

The Inter-relationship between health, safety and the environment has been established, the problems of existing industries have been identified, health and safety hazards and environmental concern, all these have to be addressed and improved .

Quality management of engineering design starts with "raw materials" or information gathering and control. The engineering portion of quality management plan addresses the design activities from the basis for project cost estimate and consequently.

The approval or disapproval of project funding. At this stage the quality management plan is to provide the design term with tools/documents that clearly state the requirements, quality expectations and ensure completeness of input data. In addition the quality management plan should enhance recognition of poorly defined units so that appropriate risk management measures can be considered.

Poorly defined scope of work results in design related rework. This normally manifests itself during detailed design stage. It results in schedule slippage, cost overruns and rework on the average, design rework account for about 12% of total installed cost, with design deviations accounting for about 80% of it.

The scope of work should clearly defined the project objectives such objectives include plant capacity, product quality project schedule and cost, use of new technology, safety, maintainability, protect expansionability, start up running cost, etc.

The basic data required during the conceptual design stage include:

a. Detailed materials and energy balance

b. Operating and design conditions for the various units and devices.

c. Construction materials, pipes and electrical fittings specifications.

d. Appropriate selection of materials and equipment's.

e. Feasibility report including guideline on reinvestment cost for future expansion.

f. Thorough evaluation of existing Federal, state and local governments regulatory and permitting requirements.

g. Site consideration: electrical power supply and distribution, real estate allowance, specifications for plant, soil condition, local building codes existing utility systems etc.

h. Environmental requirements.

i. Safety, constructability and technology. These are the three issues that must be treated together during the conceptual design stage. The quality management plan must allow for the consideration of options of various disciplines – construction,

operations, maintenance, research and development, safety, industrial hygiene, contracting etc.

j. Procurement: A detailed procurement plan showing the strategies and preferred suppliers should be prepared during the conceptual design stage. This will reduce uncertainties and quality problems particularly for the major electrical equipment, the control systems and fabricated mechanical parts [1].

CHAPTER THREE

3.0 PRESENTATION OF RESULT

3.1 METHODOLOGY OF RESEARCH

Information and statistical data required for this study were gathered basically by questionnaire, interview and by observation due to the nature of the subject. Personal interaction should produce both results and responses. The data collected were collectively examined and correlated with statistical data to form the basis for a logical conclusion. Two Nigerian Industries were visited i.e. Elf oil Nigeria Limited and WAMCO Nigeria Limited, and the following results were deduced.

3.2 RESULTS/DATA GENERATED FROM CASE STUDIES

Productivity is the increase in efficiency or the rate at which goods and services are produced. In increasing productivity, the concern is not merely increasing output but to do so with the same amount of resources. This can be achieved in terms of labour by reducing interception of working hours due to industrial accidents and ensuring the proper health and welfare of workers.

This study will therefore discuss and analyse the problems encountered by two Nigeria industries in the implementation of health and safety measures. And since the results to be discussed are based on information gathered by interview quationaire and observation from the industries involved.

HEALTH

- Quantification by number of times workers call in sick due to working conditions.
- Number of available health aids showing company's commitment to personal health.
- Number of man hours which can cause stress etc.

♎ Percentage compliance ⟶

Elf Oil Nigeria Plc ⟶ 75%

WAMCO Nigeria Plc ⟶ 85%

SAFETY

- Use of protective pears amid signs
- Number of days of loss time due to injury
- Use of alarms drills etc.
- Hazardous chemical used.

♎ Percentage compliance – Elf Oil Nigeria Plc ⟶ 62.5%

- WAMCO Nigeria Plc ⟶ 75%

WELFARE

- Commitment of management to personnel well being shown by their willingness to provide safety germs compensation in case of accidents, Medicare (for personnel and their family). Inshort do they have a health and safety policy regarding their workers?

♎ Percentage compliance = Elf Oil Nigeria Plc ⟶ 75%

WAMCO Nigeria Plc ⟶ 80%

ENVIRONMENTAL PROTECTION

- Number of times a community has called out in alarm as a result of the activities of a company
- Number of times the industry has been sited for non-compliance .
- Number of times the company has had to compensate a community for damages caused.

♎ Percentage compliance = Elf Oil Nigeria Plc ⟶ 70%

WAMCO Nigeria Plc ⟶ 70%

PROBLEM ENCOUNTERED BY THE INDUSTRIES IN IMPLEMETING HEALTH AND SAFETY MEASURES.

- Economic situation or influences in the industry.
- The management problem

♎ Percentage compliance – Elf Oil Nigeria Plc ⟶ 40%

WAMCO Nigeria Plc ⟶ 30%

SUMMARY

PERCENTAGE COMPLIANCE WITH STANDARD

INDUSTRY	HEALTH	SAFETY	WELFARE	ENVIRONMENTAL PROTECTION	PROBLEM ECOUNTERED IN IMPLEMENTATION
ELF OIL NIG PLC	75	62.5	75	70	40
WAMCO NIG PLC	85	75	80	70	40

The graphical representation is shown by Fig. (1) below:

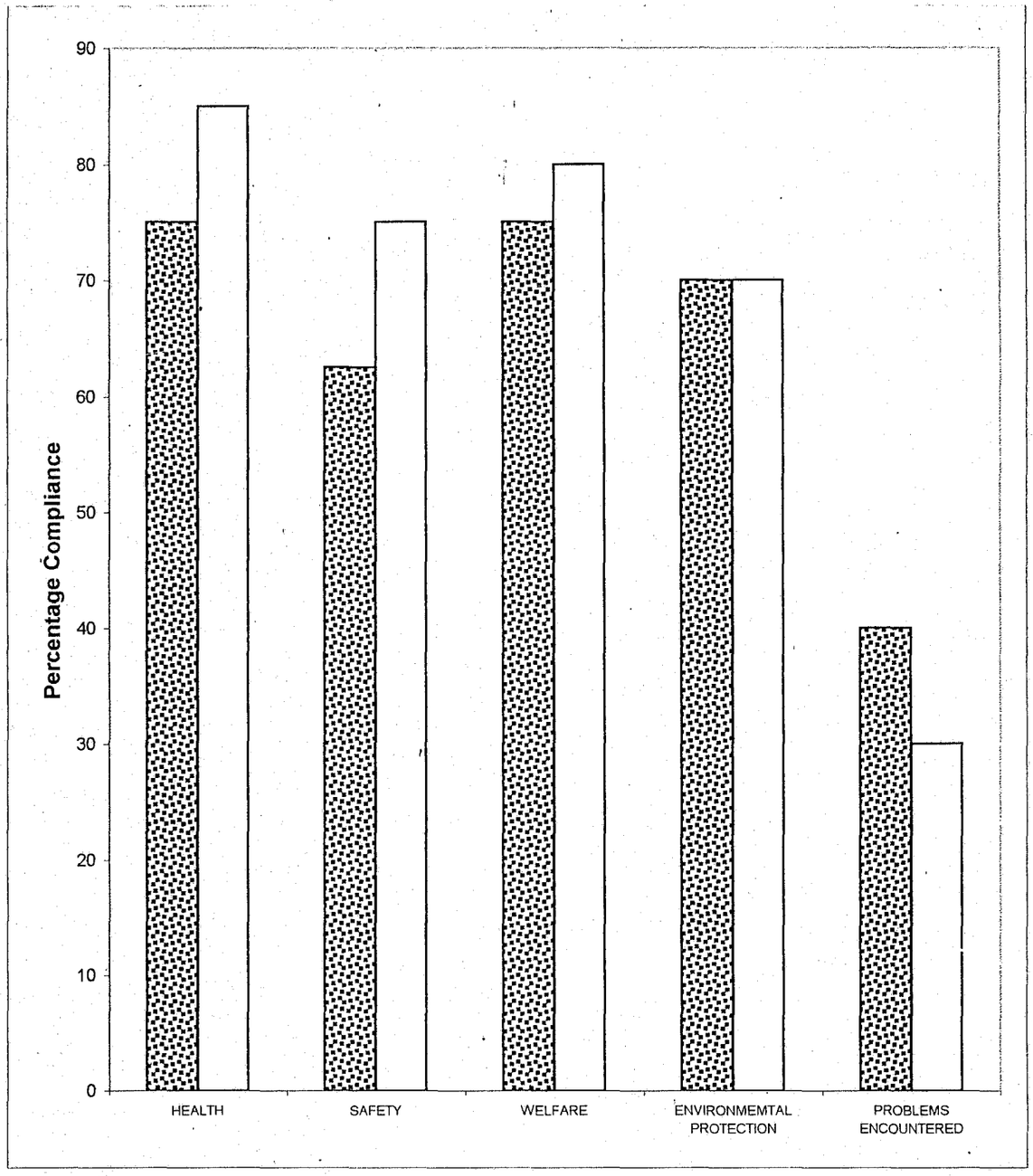

Fig. Graph showing the Percentage Compliance of Industries to Legislation on Safety and Health Measures.

CHAPTER FOUR

4.0 DISCUSSION OF RESULTS

4.1 CASE STUDY

A research was carried out on two major Nigeria manufactory industries to investigate the adequacy of their health and safety measures and to analyse the problems encountered during implementation of these measures. The two major sectors to be considered are:

1. The Oil and Gas industry (Elf Oil Nigeria Limited)
2. The Agro Allied industry (West African Milk Company Nigeria Plc)
3. Food Processing Industry.

The two industries were selected because they represent part of a majority of Nigeria industries. One industry each chosen from the two sectors for the sake of convenience, time saving and cost minimisation.

The two industries chosen were selected by random sampling techniques to represent each category. A sample of the questionnaire and in view questions will be contained in the appendix. The discussion based on the questionnaire will be divided into five major sections namely;

i. Health
ii. Safety
iii. Welfare
iv. Environmental protection
v. Problems encountered by the industries in the implementation of the health and safety measures.

4.1.1 ELF OIL NIGERIA LIMITED

Elf Oil Nigeria Limited is a major petroleum marketing company the company, inaugurated as Elf marketing Nigeria Limited started operation in February 1983 as a joint venture between Elf Acquitaine of France and a Nigeria partner .

The plant is situated at Apapa (Lagos) and has a total production work force of 150 workers directly involved n production. Elf has a reputation for its production and sale of high quality lubricants for marine, automobile and industrial purposes.

The major raw materials utilised are base oils (from NNPC) and Additives imported from France. The production process involves the blended of various base oil with additives to produce lubricants.

HEALTH

There is adequate provision for health care in the company but there is still room for further improvement such as the provision of an in-plant clinic to facilitate speedy treatment and early detection of prevailing ailments which may be as a result of the work environment. Also first – Aid boxes should be adequately stocked to take care of minor emergencies or for pre-treatment in major emergencies.

It is worthy to note that the company carries out pre-employment, pre-placement, fitness and periodic medical examinations, which will go a long way in the detection of ill health due to hazards in the work environment.

SAFETY

On the issue of safety measures there seems to be like warm attitude. There is a safety committee, but it is situated at a separate site (Head Office) which is not in close proximity to the plant and there is no safety officer attached to the plant.

Personal protective equipment are provided but there are no penalties for not wearing them. It is surprising to note that fire hazards are not really taken seriously in a petroleum industry and this can be seen from the absence of fire alarms smoke detectors, adequate fire fighting equipment and fire drills. There are also no plans for major emergencies hazards in the plant for example there are no caution sign indicating slippery surfaces.

WELFARE

The general welfare of the worker is fairly adequate. They are given hourly break periods daily during which lunch is served in the staff canteen. Also there is provision for sick or wounded workers who are sent to company retainer hospitals or clinics.

Insurance schemes are provided for workers in case of accidents or death and this is to aid in the compensation of such workers in accordance with the "Workmen's compensations Acts 1990". Toilet facilities, showers and potable water are also provided but there is an absence of a locker room.

ENVIRONMENTAL PROTECTION

This has become a globally sensitive and important issue with the increased awareness of the effects of pollutants on the atmosphere, flora fauna. There are three forms of pollutant or wastes from industries, viz. solid, liquid and gaseous.

The wastes from this industry are mainly solids (refuse) and liquids. The disposal of the solid wastes are catered for the State Waste Disposal Board while the oil in the liquid waste is removed via separators and the residual wastewater discharged. Monthly effluent tests are carried out to monitor the amount of pollutants remaining in the liquid waste discharged.

PROBLEMS ENCOUNTERED BY THE INDUSTRY

The basic problem in the implementation of safety and health measures in their industry arises from the management and this is because the management does not fully realise the importance of these measures since there has been no major accident in the plant. It is believed that if they were adequate and efficient factory inspectors from the government there would be improved safety programmes.

The economics situation in the country has also affected these measures and as a result there is a reduction in the frequency at which personal protective equipment and replaced and the number given to each worker.

4.1.2 WEST AFRICAN MILK COMPANY (NIGERIA) PLC.

West African Milk Company (Nigeria) Plc is a diary producing industry established in 1973 as a joint venture between Nigeria and Dutch partners.

The company operations involve processing and canning of evaporated milk. Notables amongst its product are Peak Milk and Three-Crown Milk. The plant is situated at Ikeja (Lagos) and has a total production population of 500 workers aged between 24-50 years.

Their major raw materials are skimmed milk powders, butter milk powder and tin plates majority of which are imported from Holland.

HEALTH

There is adequate provision for health in the company and this is reflected in the availability of an inplant clinic well stocked and adequate first aid boxes and trained first aiders.

Also there is medical surveillance of worker especially those working in sensitive areas such as food handling, which is carried out annually. Records are kept, therefore any prevailing ailment can be detected easily.

SAFETY

Safety can be deemed to be primary on the company's agenda with caution signs boldly posted in strategic areas, fire exist and doors clearly marked, fire alarms and extinguishes in every room and doors clearly marked, fire alarms and extinguishes in every room and department. Fire drills are carried out half yearly and the company has major plans for emergencies, which are known, to all staff.

On the issue of protective clothing and equipment, the workers are facilitated with suitable protective clothing and equipment for their operations and are penalised if found not utilising them. The company's positive altitude towards safety is strongly reflected in the fact that is 1995 it did not record any major accidents, either to workers or equipment.

WELFARE

The welfare of the workers is satisfactory. There is provision of an in-plant clinic for speedy treatment of workers, a medically supervised canteen in which employees can eat during this hourly breaks. Compensation is granted in cases of accident, injuries and death resulting from work exposure to workers in accordance with the "Workmen's compensation Act 1990". There is provision of general facilities such as toilets, showers, locker rooms and potable water.

ENVIRONMENTAL PROTECTION

The waste from this industry comprises of solids and liquid. The solid wastes are removed by the state waste Disposal Board while the liquid waste is sent into a treatment plant. There is constant monitoring and updating of levels of various pollutants permissible within the working environment.

PROBLEMS ENCOUNTERED BY INDUSTRY.

The main problem encountered by the industry is economic in nature and is as a result of the escalating prices of Drugs, which have resulted in the company's increased spending. Although prices of Drugs are increasing, the company does not comprise the health of its employees by decreasing the purchase of drugs but instead makes sure is an adequate supply of drugs.

4.2 GENERAL DISCUSSION.

From the two industries studied, one was found to be almost hazard free. The management of the industry is consciously of industrial health and safety. However the incentive for all industry to keep a healthy and safe working environment is two fold. One is the humanitarian concern for the well human suffering, and the other is cost.

It is more economic on the long run to maintain an account – free factory and to have full attendance at work than to have extensive lost time due to work related injuries and accidents. These incentives are evident in the two industries studies, but to varying

degrees. Some industries tend to take only the cost incentive into consideration thus putting in place the best minimum of health and safety measures.

The questionnaires filled show that there has not been any conflict between the workers and the management in recent times relating to health and safety in any of the industry, the absence of this conflict does not necessary mean that the workers are satisfied with their work. Conditions or their welfare is being well catered for by the management. It could imply that the workers are ignorant of the hazards around them and the effects these hazards could have on them. For example, the workers might not be fully aware of the extent of damage that a slippery surface of a blending unit could have on this health.

Industry management try to provide workers with personal safety equipment and remove apparent damages in the work environment, but the equipment may be old. This could be dangerous to the workers as this might lead to accidents. Getting new equipment and maintain the existing ones, can be quite expensive due to the economic situation much cannot be said concerning the accident rate. The data available shows it to be low, but one cannot rely on this information because it may be in accurate. Most accidents or illness are not reported to the appropriate authorities.

On the issue of factory inspectors, one can see from the questionnaire responses that government inspectors are lacking and this is contributing to the related attitude of some industries towards health and safety measures. Because most companies know that there is no click on their performances in maintaining safe and healthy work environment, they generally do the best they can on their own terms.

Making workers to operate in slightly bearable conditions or with mediocre equipment, instead of investing in safety programme on the run reduces productivity in an industry. Irrespective of an organisation's involvement's, the human elements are the most important and should be well catered for.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

From the investigation carried out, the following conclusion can be drawn.

1. There is general awareness on the part of industries towards occupational health and safety.
2. The occupational health and safety legislation and its enforcement by government is inadequate.
3. A safe and health work environment results from efficient safety officials.
4. The economic condition of an industry depicts the level of implementation of health and safety measures.

Finally, although a lot has been done by both the government and industries on occupational health and safety, one can conclusively sat that there is still a lot of room for improvement, especially on the part of the government.

5.2 RECOMMENDATION

From the study carried out, the following recommendations have been suggested.

1. Industries should have well defined safety programme, which should depend on the nature, size and production technique of the industry.
2. Each industry should have safety officers and a safety committee whose functions could be to set policies and general procedures for safety and to review safety performance.
3. Proper engineering works to remove work hazards in industries should be fundamental. The best way of engineering for safety is simply to eliminate the hazard from the machine or process.
4. Safety education for all levels of management and for employees should be the aim of all industries. Education in this context concerns the development of proper perspective and attitude towards safety.

5. Government should invest more in occupational health and safety by employing more factory inspectors and ensuring that factories are duly inspected.

6. Incentives such as awards should be given to industries which excel in the implementation of health and safety measures.

7. Erring Industries should by given a formal notice by government to improve their implementation of health and safety measures or risk being shut down.

8. The adopted legislations on occupational health and safety should be reviewed to suit industries in Nigeria.

9. A subject such as health and safety is a common industry problem thus there should be co-operation between Nigeria industries in the form of seminars and lecturers, to find solutions to the problems they face in the implementation of the health and safety measures.

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APPENDIX
QUESTIONNAIRE

1. GENERAL

NAME OF INDUSTRY: ELF OIL NIGERIA LTD.

Address: 91 CREEK ROAD APAPA

Date of visit: 2/7/99

Type of Industry: PETROLEUM INDUSTRY

Foreign owned ☐ Nigerian Owned ☐ Joint Ownership ☑

Date of Establishment: 1983

What does the Industry do? LUBRICANTS FOR MAKING AUTOMOBILE AND INDUSTRIAL PURPOSES

What products are manufactured? LUBRICANTS FOR MAKING AUTOMOBILE AND INDUSTRY PURPOSES

List the raw materials used: BASE OIL AND ADDITIVES

Are they sourced locally or imported? IMPORTED

If imported, country of origin: FRANCE

Brief description of manufacturing process carried out: BASE OIL ARE BLENDED WITH ADDITIVES AND PASSED ON TO BE FILLED INTO CANS AND DRUM

Production personal population: 180

Age group: 20 — 40

Hours of work: 7.30 — 4.30 PM

Day ☐ Shift ☐ Weekends ☑ Overtime ☑ Nightwork

2. WELFARE

Are there sickness benefits? ☐ Yes ☑ No

Are there workmen's compensation? ☑ Yes ☐ No

Canteen ☑ Yes ☐

Is there medical supervision of canteen? ☑ Yes ☐ No

3. GENERAL FACILITIES

Toilet Facilities [✓] Yes [ ] No

Locker room [ ] Yes [✓] No

Showers [✓] Yes [ ] No

Is potable water available [✓] Yes [ ] No

4. MEDICAL FACILITIES

In-plant clinic [ ] Yes [✓] No

Are there first aiders [✓] No [ ]

Are they trained [✓] Yes [ ] No

Are first aid boxes available [✓] Yes [ ] No

Where are they located: LABORATORY WARE HOUSE

Are the contents satisfactory [ ] Yes [ ] No . FAIRLY .

Are records of first aid treatment kept [ ] Yes [✓] No

5. ACCIDENT PREVENTION MEASURES

Safety officers [ ] Yes [✓] No

Safety committee [✓] Yes [ ] No

Fire precaution:

Fire points [✓] Adequate [ ] Inadequate

Fire alarms [ ] Yes [✓] No

Smoke detector [ ] Yes [✓] No

Fire drills [ ] Yes [✓] No (LAST IN 1990)

How often? Weekly [ ] Monthly [ ] Half yearly [ ] Yearly

Fire fighting devices [ ] Adequate [✓] Inadequate

Fire exits [✓] Yes [ ] No

All sectors easily accessible [ ] Yes [ ] No

6. EMERGENCIES

Any plans for major emergencies [ ] Yes [✓] No

Are all staff aware of this plan [ ] Yes [✓] No

7. MEDICAL SURVAILLANCE OF WORKERS

Pre-employment/Pre-placement medical examination [✓] Yes [ ] No

Any special examinations performed on certain workers e.g. workers in dusty operations, food handlers, fitness e.t.c [✓] Yes [ ] No

ENVIRONMENTAL SANITATION

METHODS OF DISPOSAL OF REFUSE/INDUSTRIAL WASTE

i. Solid (Refuse) Lagos State waste disposal board

ii. Liquid Use of Separators to remove oil before disposal.

Are these method of disposal adequate [✓] Yes [ ] No

Do they comply to FEPA regulations [✓] Yes [ ] No

What effects has the economic situation in the country had on the health and safety measures in yo industry? For an industry like this with few employees and large output I would say that the economic situation in the country has not really made such a significant impact on our health and safety measures but it has never affect such as a slight reduction in the frequency of with which personal protective equipment are replaced.

6. Would there be a significant change in your employee's health and safety if there were adequa and effective inspectors?

Generally those aspects of factories are incompetent many of them easily impressed by gifts from company soliciting for good report of satisfactory inspectors do not enforce penalty on small Company and other do not do it regularly because safety progr Must be introduced if the inspectors were efficients.

7. What problems are encountered by your industry in the enforcement of health and safe measures?.

Because of the low rate of accident, those measures are Generally taken for granted by the management.

8. Do you monitor and update levels of various pollutants permissible within the workin environment?

Yes, Monthly tests are carried out.

9. Do you have specific safety codes of practice on possible hazards in your industry?

No

10. Have you encountered industrial health and safety as an issue of industrial conflict recently?

No

How often? YEARLY

Are periodic medical examinations carried our [✓] Yes [ ] No

Any medical records kept [✓] Yes [ ] No

Are accident records kept [✓] Yes [ ] No

How many accidents did you have in 1995? TWO

Was there damage to equipment? NO

Were personnel injured [✓] Yes [ ] No

What type of injuries normally occur Cuts wound and bruises

What are the occupational harzards present: Falling objects.

and Slippery Surfaces.

8. PROTECTIVE CLOTHING/EQUIPMENT

Eye bath [ ] Yes [✓] No

Barrier creams [ ] Yes [✓] No

Ventilators [✓] Yes [ ] No

Stand by Generator [✓] Yes [ ] No

PERSONAL PROTECTIVE EQUIPMENT

Mask [ ] Yes [✓] No

Overalls [✓] Yes [ ] No

Goggles [ ] Yes [✓] No

Safety caps [✓] Yes [ ] No

Gloves [✓] Yes [ ] No

Boots [✓] Yes [ ] No

How often are protective clothing and equipment replaced: Yearly.

Do employee's wear them [✓] Yes [ ] No [ ] Occasionally

If not, why? —

Are they suitable for the industrial operations [✓] Yes [ ] No

Are workers penalized for not wearing them [ ] Yes [✓] No

SAMPLE INTERVIEW QUESTIONS

1. Which ailment is most popular amongst workers?

Generally there are normly Complaints of headaches which could be due to tension felts during work hours or as a result of

2. What is being done to reduce these cruel on the workers health?

Workers are given a one from period for break during which lunch is served for 30 mins and the remaining time for rest.

3. It is generally the case that workers refuse or ignore the use of personal safety equipme provided, how do you tackle this problem.

I do not believe that we can encounter such problems because due to the nature of the job, workers prefers use personal safety equipment for example overall are always work because of the possibility of oil.

4. How do you educate your employees on health and safety?

New workers are given training session which include health and safety and sometime workers are sent off the Company to attend training seminars.

APPENDIX
QUESTIONNAIRE

1. GENERAL

NAME OF INDUSTRY: WEST AFRICA MILK COMPANY(NIG) PLC

Address: P.M.B 21319, Ikeja

Date of visit: 06/07/99

Type of Industry: Diary company

Foreign owned ☐ Nigerian Owned ☐ Joint Ownership ☑

Date of Establishment: 1973

What does the Industry do? Processing and canning of evaporated milk

What products are manufactured? Milk

List the raw materials used: Skim milk powder, better milk tin plates etc

Are they sourced locally or imported? Imported and locally sourced

If imported, country of origin: Holland

Brief description of manufacturing process carried out: Production of cans processing of milk and canning of the processed milk

Production personal population: 500 workers

Age group: 20 and 54 years

Hours of work: 40 hours per week

Day ☑ Shift ☑ Weekends ☐ Overtime ☑ Nightwork

2. WELFARE

Are there sickness benefits? ☑ Yes ☐ No

Are there workmen's compensation? ☑ Yes ☐ No

Canteen ☑ Yes ☐

Is there medical supervision of canteen? ☑ Yes ☐ No

3. GENERAL FACILITIES

Toilet Facilities [✓] Yes [ ] No

Locker room [✓] Yes [ ] No

Showers [✓] Yes [ ] No

Is potable water available [✓] Yes [ ] No

4. MEDICAL FACILITIES

In-plant clinic [✓] Yes [ ] No

Are there first aiders [✓] No [ ]

Are they trained [✓] Yes [ ] No

Are first aid boxes available [✓] Yes [ ] No

Where are they located: Milk and can factories

Are the contents satisfactory [✓] Yes [ ] No

Are records of first aid treatment kept [ ] Yes [✓] No

5. ACCIDENT PREVENTION MEASURES

Safety officers [✓] Yes [ ] No

Safety committee [✓] Yes [ ] No

Fire precaution:

Fire points [✓] Adequate [ ] Inadequate

Fire alarms [✓] Yes [ ] No

Smoke detector [ ] Yes [✓] No

Fire drills [✓] Yes [ ] No

How often? Weekly [ ] Monthly [✓] Half yearly [ ] Yearly

Fire fighting devices [✓] Adequate [ ] Inadequate

Fire exits [✓] Yes [ ] No

All sectors easily accessible [✓] Yes [ ] No

6. EMERGENCIES

Any plans for major emergencies [✓] Yes [ ] No

Are all staff aware of this plan [✓] Yes [ ] No

7. MEDICAL SURVAILLANCE OF WORKERS

Pre-employment/Pre-placement medical examination [✓] Yes [ ] No

Any special examinations performed on certain workers e.g. workers in dusty operations, food handlers, fitness e.t.c [✓] Yes [ ] No

How often? annually

Are periodic medical examinations carried our [✓] Yes [ ] No

Any medical records kept [✓] Yes [ ] No

Are accident records kept [✓] Yes [ ] No

How many accidents did you have in 1995? None

Was there damage to equipment? No

Were personnel injured [ ] Yes [✓] No

What type of injuries normally occur Cuts

What are the occupational harzards present:

8. **PROTECTIVE CLOTHING/EQUIPMENT**

Eye bath [✓] Yes [ ] No

Barrier creams [ ] Yes [✓] No

Ventilators [✓] Yes [ ] No

Stand by Generator [✓] Yes [ ] No

PERSONAL PROTECTIVE EQUIPMENT

Mask [✓] Yes [ ] No

Overalls [✓] Yes [ ] No

Goggles [✓] Yes [ ] No

Safety caps [✓] Yes [ ] No

Gloves [✓] Yes [ ] No

Boots [✓] Yes [ ] No

How often are protective clothing and equipment replaced:

when ever necessary

Do employee's wear them [✓] Yes [ ] No [ ] Occasionally

If not, why? N/A

Are they suitable for the industrial operations [✓] Yes [ ] No

Are workers penalized for not wearing them [✓] Yes [ ] No

ENVIRONMENTAL SANITATION

METHODS OF DISPOSAL OF REFUSE/INDUSTRIAL WASTE

i. Solid ..... Physical evacuation .....

ii. Liquid ..... effluent treatment plant .....

Are these method of disposal adequate [✓] Yes [ ] No

Do they comply to FEPA regulations [✓] Yes [ ] No

What effects has the economic situation in the country had on the health and safety measures in industry? .....

..... Not much as the company still purchases adeq drugs for the clinic .....

.....

.....

6. Would there be a significant change in your employee's health and safety if there were adeq and effective inspectors?

.....

..... Not really .....

.....

.....

.....

7. What problems are encountered by your industry in the enforcement of health and saf measures?.

.....

..... Increased spending due to high costs of drugs .....

.....

.....

.....

8. Do you monitor and update levels of various pollutants permissible within the worki environment?

.....

..... Yes .....

9. Do you have specific safety codes of practice on possible hazards in your industry?

Yes

10. Have you encountered industrial health and safety as an issue of industrial conflict recently?

No

SAMPLE INTERVIEW QUESTIONS

1. Which ailment is most popular amongst workers?

Malaria

2. What is being done to reduce these cruel on the workers health?

Workers are advised to get rid of mosquitoes in their homes or use mosquitoes net

3. It is generally the case that workers refuse or ignore the use of personal safety equipme provided, how do you tackle this problem.

Through disciplinary measures

4. How do you educate your employees on health and safety?

Through stickers and their supervisors.