SAFETY IN THE WORKPLACE (CASE STUDY – IBOM POWER GENERATING COMPANY)

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About IBOM POWER: The Ibom Power Plant is situated at Ikot AbasiL.G.A in Akwa Ibom State. The Plant was conceived to generate 685 megawatt of Power to be implemented in two phases. Phase 1 of the projectis operational and has an installed capacity of 191 MW while modalities have been in place forthe Phase 2 with an expected capacity of 500 MW.

The Ibom Power Company is one of the safest Power Generation Companies in Nigeria; this is based on the fact that the company has not recorded any workplace fatality from inception till date. In recognition of this, Ibom Power Company won the best Safety Award for Workplace Safety in Nigeria from OSHA-UK 2022.

In Ibom Power Company where high voltage equipment, gas, chemicals, heavy machinery etc are used to generate electric power, there is likelihood for incidents and accidents if proper safety measures are not adhered to.

To maintain continuous safe system inthe workplace, every individual working or visiting Ibom Power Plant has the responsibility to attend safety induction, to enable him/her reduce the level of risk that he/she is exposed to when at Ibom Power Plant.**In line with Part 1 section 1.5 (a) and (b) of Nigerian Electricity Health & Safety Code 2014.**

INTRODUCTION:

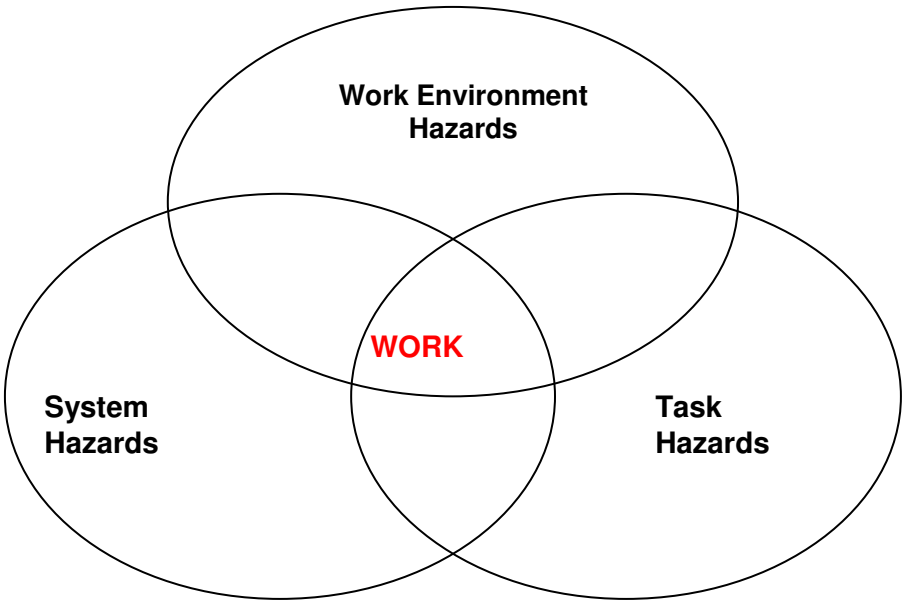
SAFETY: Keeping off or avoiding danger or dangerous situation. The state of being Safe, freedom from the occurrence or risk of injury, danger, or loss. The quality of averting or not causing injury, danger or loss. "Dictionary .com".

Hazard: Something with the potential to cause harm.

Harm: Loss, injury or Fatality caused by a hazard.

The Management of Health and Safety at Work Regulations 1999 (Regulation 3) require Employers to undertake Suitable and Sufficient assessments of all risks to the Health and Safety of employees whilst at Workplace.

At Ibom Power Company the hazards that occur from undertaking work have been identified as arising from three areas:



System hazardssuch as fires and explosion, equipment failure, chemical spill, damaged insulationetc,arise from the Plant (Turbine) and Equipment (Motors, Valves, Pumps, Breakers, etc.) used at Ibom Power Plant site.

The risks arising from these hazards are controlled by the following mediums; Safe Working Procedures, Regular HSE training, Preventive and Corrective inspections, Logout and Tag-out Procedure (LOTO). In accordance to **Part 1 section (1 i,ii and iii) of the Nigerian Electricity Health and Safety code 2014.**

Work Environment Hazardssuchas (1) Trips, Slips and Falls, wet conditions, (2) Oil spillage from Transformer, Turbines, and other equipment or machinesarise from the local environment in which the work is taking place.

The risks arising from these hazards are assessed and controlled by use of (a) Work Area Safety Assessment Procedures, (b) Oil spillage clean-up process, (c) floor contamination and reclamation exercise (d) waste oil treatment and disposal measures. **In accordance to S.I 19 ofNigerian Environment protection regulation 1999.**

Task Hazardssuch as exposed electrical Parts, electrocution, Improper grounding, damaged tools and equipment, confine space entry,arise from the task that is taking place at the plant and are controlled by the following measures.

(1)Eliminate the hazard (Remove it completely from your workplace). (2)Substitute the hazard. (Replace it with a safer alternative). (3)Isolate the hazard. (Keep it away from workers as much as possible).(4)Use engineering controls.(5)Use administrative controls. (6)Use personal protective equipment (PPE). In accordance with **Part II Section 2.7 of the Nigerian Electricity Health & Safety code 2014.**

Measures to Prevent workplace Hazards

1. **Daily Toolbox Talk**

   HSE officers usually conduct **"daily tool box meetings"** in conjunction with the O/M personnel at the plant site.

   During the meetings a job safety analysis and job plan are discussed with emphasis on elimination of potential accidents and corrective measures to prevent workplaceincidents and accidents especially one that may lead to fatalities,**In line with Part I section (d) of the Nigerian Electricity Health and Safety code 2014** stated that toolbox meetings shall be conducted daily prior to the beginning of any task and supervisor on duty shall comply with job hazard analysis procedure.

2. **ELECTROCUTION:**

   Power plant employees work in close proximity with high voltage carrying equipment such as electrical conductors, switchgear components, power transformers etc. This makes them vulnerable to electrical shocks and electrocution at work when there is no proper training, laid down policies and procedures with an attendant consequence of temporary or permanent injury even fatality.

   During inspection, servicing or repairs of energized electrical equipment in the plant site, IPC technical personal usually conduct **"Logout/tag-out procedures (LOTO)"** by turning off the electrical power to ensure safety of the personnel working on the equipment. I accordance with **Part II Section 2.7 of the Nigerian Electricity Health & Safety code 2014.**

   Logout is the process of removing the source of electric power and installing a lock with a key which prevents the power from being re-energized or turned ON for that equipment.

   Tagout is the process of placing a red coloured danger tag on the source of electrical power which indicates that the said electrical equipment may not be operated until the danger tag is removed.

3. **FIRES AND EXPLOSION:**

   IPC HSE Officers carryout regular inspection and certification of firefighting equipment such as deluge fire sprinkler, fire hydrants, automated and manual fire extinguishers in the plant to ensure emergency preparedness incase of fire occurrence. Also cell phones are not authorized to be used at gas turbine areas to prevent electromagnetic explosion in plant in accordance with**Part II section 2 (I) (1-13) of the Nigerian Electricity Health**

and Safety Standards Manual or NFPA Standards, provides Fire Protection, Evacuation, first Responder and Emergency Planning at electrical workplace.

HSE Officers also conducts quarterly fire drill excises in the company to enhance awareness for the personnel on emergency evacuation in the event of fire occurrence. IPC has nine fire hydrant stations and two fire truck vehicle to serve as a back-up to other automated and manual firefighting equipment in the company.
Emergency alarm machine is placed at strategic locations to act as a back-up and repeater signal alarm to detect smoke, fire, hazardous gases or any other dangerous emergency occurrence in the plant.

4. **CONFINED SPACES:**

Serious accidents, often involving multiple fatalities,might occurred during work activities involving entry into confined spaces. Some confine SpaceHazards on site are.

- The drowning of any person arising from an increase in the level of a liquid in spaces such as the raw water storage tanks, de-mineralized and portable water tanks
- The loss of consciousness or asphyxiation of any person at work arising from hazardousgas, vapour, fume or lack of oxygen.
- The loss of consciousness of a person at work arising from an increase in body temperature whilst in the confined space.

Before entry is allowed into any confined space on Ibom power plant site,HSE officers takeeffective steps and precautions to prevent ingress or presence of any dangerous material. Additionally adequate steps are taken to ensure that;

- Any wax, sludge or other material liable to give off dangerous gases or fumes has been completely removed.
- Any “free flowing solids” have been removed and secured.
- The space has been adequately ventilated and tested for dangerous gases or fumes.
- The space has an adequate supply of air/oxygen for safe and comfortable respiration as outlined in **Part II Section 2 (v) of the Nigerian Electricity Health and Safety Standards Manual.**

5. **PROTECTION FROM OVER CURRENT:**

Power plant employees must ensure the application of all protective measures in case of over current in the power plant. Appropriate proactive measure must be put in place to protect machines and personnel, as to where and when it happens. In accordance to the**Part II section 2.10 (a) of the Nigerian Electricity Health and Safety Code 2014** which stated that every employer shall provide protection against flash hazard in the workplace.

6. **CYBER THREATS:**

   Cyber threats in power plants come with dire consequences if not properly checked.

7. **ENVRIONMENTAL PROTECTION**

   A. Toilet Facilities: The Ibom Power Company has provided 12numbers of toilets facilities in the plant for men and women.

   The toilet facilities are always clean, with enough water and toiletries to keep them always tidy.

   B.**Solid wastes** generated inside IPC site are disposed in accordance to**S.I 18 & 19 of theNigerian Environmental protection regulation 1999.**

   All waste generated in the plant are controlled, labeled, and stored in standard waste colored code bins. The companyengages three certified waste disposal contractors to dispose waste twice a week. **Waste disposal records are maintained in the IPC site environmental waste management log.**

   C. Sound level Checks Ibom Power Company (IPC) HSE conducts daily safety walk downs on site to monitor the turbines sound level and the air quality of the environment to ensure that the turbine sound doesn't post negative impact to staff and members of the public.**In line with Part II section 2.2 a -d of the Nigerian Electricity Health and Safety Code 2014** stated that every employer shall carry out noise survey, generate noise map and issue appropriate hearing protection to all employees.

8. **Health Care**

   The Ibom PowerCompany provides health facility at the plant site to personnel at no cost.

   Sick employees of the company are treated at the site clinic while relatives of employees are treated at various HMO Health Maintenance Organization clinic of their choice. In accordance to Part II section 2.5 a & b of the **Nigerian Electricity Health and Safety Code 2014**which stated that Every employer shall provide a first aid facility in all workplace, site and projects.

9. **ILLUMINATION OF PLANT:**

   Adequate lighting is provided at Ibom power site to facilitate proper illumination of work, operation and administrative areas. Streetlights and flood lights are provided for movements within the plant environment during the night or cloudy times to prevent accidents. These lights come on automatically when the photocell senses low visibility in the environment. **Backup generators** areinstalled as standby power source in the event of a blackout from grid loss.**In line with Part 1 section 1.3 viii of the Nigerian Electricity Health and Safety Code 2014** which states that every employer who operates an electrical workplace is required under the NEH&S code: to provides clean light fixtures and provide efficient lighting at the workplace.

CATEGORIES OF PERSONAL PROTECTIVE EQUIPMENT (PPE) USED IN IPC:

Part II section a(i , ii) and b (i –v) **of Nigerian Electricity Health and Safety Code 2014** mandates every employer shall assess the workplace to determine if the hazard are present, or likely to be present , and requiring the use of Personal Protective Equipment (PPEs).

In Ibom Power Plant PPE can be considered in the following different categories.

a. **HEAD:**
   Head is the foremost part of the body which carries the Eyes, Nose, Ear, Mouth etc. and must be protected from all forms of injuries. Therefore, employees are provided with hardhats, which are classified into three categories;
   i. Class A (Vol res up to 22kv)
   ii. Class B (Vol res up to 20kv)
   iii. Class C (Provide protection against light weights.)

b. **SIGHT (EYE):**
   Eyes are protected with;
   i. Safety glasses,
   ii. Eye shields,
   iii. Goggles,
   iv. Face shields, etc.

c. **HEARING (EAR):**
   Hearing protection equipment are necessary to protect the eardrums if the noise or sound level exceeds 85 decibels from the machines. For the protection, equipment like earplugs, semi-insert earplugs and ear muffs are used.

d. **BREATHING (NOSE):**
   Chemicals, dust can enter the body through breathing thereby causing chest pain, headache and other symptoms related to breathing problems. Therefore, respiratory safety equipment like disposable filtering half mask, half mask, full face mask, etc. are used.

e. **HANDLING (HAND):**
   Harmful substances and chemicals can get absorbed into the skin thereby causing bruises, cuts, abrasion, etc. To avoid these, hand gloves, finger guards and arm coverings, are used.

f. **FOOTING (FOOT):**
   In Plant areas, falling from height, rolling down, crushing or penetrating pointed materials are more common. To protect the foot from all these, employees need to use the following:-
   I) Safety toe shoes
   II) Material guards

III) Toe guards
IV) Leggings
V) Studded treads, etc.

CONCLUSION:

One of the "root causes" of workplace injuries, illnesses, and incidents is the failure to identify or recognize hazards that are present, or that could have been anticipated.

A critical element of any effective safety and health program is a proactive ongoing process to identify, assessed and eliminate workplace hazards.

This is in line with Part 1 section 2.3 (f) of the Nigerian Electricity Health and Safety Code 2014, which states that every employer shall conduct hazard assessment as a performance –oriented provision that enable them to determine appropriate control measure for identified hazards in the workplace.

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