Certificate

Standard **BS OHSAS 18001:2007**

Certificate Registr. No. 01 113 1615068

Certificate Holder:

ENCOCORP SARL
Shell street,
ENCOCORP Headquarters
Dora Sea Side
Lebanon

Head office and all branches according to annex

Scope: Engineering, Procurement and Construction (EPC)

Proof has been furnished by means of an audit that the requirements of BS OHSAS 18001:2007 are met.

Validity: The certificate is valid from 2016-12-08 until 2019-12-07.

2016-12-13

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Annex to certificate

Standard **BS OHSAS 18001:2007**

Certificate Reg. No. 01 113 1615068

No.	Location
/02	**ENCOCORP Saudi Lebanese Engineers and Contractors Corps** King Abdullah Street, Al Baghdadieh, Bourj Al Tamlik Tower, 6th floor, Jeddah, Kingdom of Saudi Arabia.
/03	**ENCOCORP Emirates** Beni Yas Street, Khalfan Abdallah Zayed Al Mazroui Building, Abu Dhabi, United Arab Emirates.
/04	**ENCOCORP Qatar** Al Sed Street, Saad Abdel Aziz El Saad Building, Doha, Qatar.
/05	**ENCOCORP Saudi Lebanese Engineers and Contractors Corps** Abu Hadriya Highway, ENCOCORP Facility, Al Jubeil, Kingdom of Saudi Arabia.

2016-12-13

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ENCOCORP

Health and Safety Manual

EDITION: Fifth

Revision /Edition	Remarks	Revised by	Date
Fifth	Adaptation to OHSAS 18001 standard requirements	H&S committee	26-Augst-2016
Fourth	HSE Comments Incorporated	GD	22-SEP-2015
Third	HSE Comments Incorporated	KK	20-JAN-2012
Second	HSE Comments Incorporated	JKP	24-MAY-2010
First	Issued for approval	AD	15-FEB-2008

Reviewed & Issued By :		**Reviewed & Approved By:**	
Name:		Name:	
Position:		Position:	
Date:		Date:	
Sign:		Sign:	

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1. Introduction

This document has been prepared to outline the specific measures to be taken by ENCOCORP, to prevent human injuries and property damage, and to ensure compliance with the Client health and safety requirements & ENCOCORP safety manual. The Safety Plans and Procedures will be in compliance with the applicable laws, Decrees, and Regulations of the Kingdom of Saudi Arabia, and the Project Specific Safety Procedures and Requirements.

ENCOCORP will have a designated Safety Representative responsible for implementing and coordinating the overall Project Safety Plan.

The summary of Safety and Health Standards applicable to the Construction Industry in this manual was compiled to aid the Project Management, Supervisors, HSE Personnel, and Employees in their efforts to comply with ENCOCORP and Saudi Arabian Government Standards at Construction Worksites.

This manual does not contain all the Safety and Health Standards applicable to the Construction Industry. It does however; contain an overview of those standards most frequently overlooked by construction employers and standards covering the project and situations that are particularly hazardous.

2. H&S Policy

ENCOCORP is a leading Engineering Procurement and Construction services provider for industrial tanks and structures, and Procurement and Construction services provider for industrial process piping and Construction services provider for constructing industrial plants, in the MENA and GCC areas.

ENCOCORP Management is firmly committed to perform all work activities safely, adopt all possible measures to reduce and eventually eliminate all risks to the **safety**, health and welfare of workers, contractors, authorized consultants & visitors, and those who may be affected by our operations, within the laws and regulations of the country in operation.

ENCOCORP management commits also to provide and maintain:

- All customers and interested party's requirements;
- Healthy, safe and secure environment for all interested parties;
- The necessary resources for the achievement of the objectives;
- Adequate managerial, technical and operational control measures.

ENCOCORP is implementing, communicating and maintaining an Occupational Health and Safety Management System based on the requirements of international standard **OHSAS 18001 v. 2007 with the objective of eradicating lost time**.

ENCOCORP ensures that all personnel involved in their operations have attained the appropriate safety awareness and induction training and that they understand and realize the hazards and risks of the performed activities and consequently implement the relevant and specific required control measures.

ENCOCORP continually strives to improve the performance of its occupational health and safety management system, by setting clear objectives and authorizing all of their people involved in their operations and construction activities **to stop any hazardous activity on the spot** and request the **immediate** intervention of the assigned responsible entity.

ENCOCORP Management is committed to review the Policy and Objectives early and to ensure conformity to the purpose of the organization.

Garo Dermosessian
Managing Director

3. H&S Committee composition

ENCOCORP supports the training and active involvement of health and safety consultation through management and designated workgroup (department employees).

a- The Health and Safety committee will consist of:

- ✓ Managing director;
- ✓ Management;
- ✓ Nominated Safety manager;
- ✓ Nominated safety officer/supervisor if manager doesn't exist

b- Health and safety organizational chart is developed by project and based on the requirements of the customer which may contain H&S Manager, H&S supervisor and H&S inspector.

4. Hazard identification and risk assessment procedure

Before initiating the identification of potential hazards, the H&S committee should break down the activities of each process into a sequence of major steps, with each step describing taken actions as per ENCOCORP Risk matrix (to be confirmed by Committee). All inputs and outputs of the process activities as well as outsourced or subcontracted processes within the H&S management system shall be considered.

All processes shall participate, by its assigned representatives in the H&S Team, to the H&S Risk Analysis.

Once the sequence of major process activities is described, the identification of potential hazard should be conducted to determine how the process interacts with the H&S and define associated risks or benefits.

The breakdown of activities for each process, by the H&S Committee, shall take into consideration the following elements covering all activities having a potential risk:

- Routine and non-routine activity ;
- Activities of all concerned parties having access to the workplace (including contractors & visitors);
- Human behaviour, capabilities, and other human factors;
- Hazards originating outside the workplace boundaries which are capable of adversely affecting the health and safety of personnel within the area of operation;
- Hazards occurred in the vicinity of the workplaces by work related activities under control;
- Infrastructure, equipment and material at the assigned workplace, provided by or to ENCOCORP;
- Applicable legal obligation relating to the risk assessment and implementation of necessary controls.

4.1 Assessment of H&S Risks:

Upon identifying H&S hazards, a quantitative approach shall be used to determine whether associated risks are High, Medium, or low. This approach is based on the risk assessment matrix.

Inherent Risk:
In the first stage, each risk shall be assessed regardless of existing control measures through a score based on a scale of four values from 1 to 4

(1-2-3-4), using the following method:

HS: Severity x Frequency

Severity	**4** (Catastrophic)	4	8	12	16
	3 (Severe)	3	6	9	12
	2 (Critical)	2	4	6	8
	1 (Incidental)	1	2	3	4
		1 (Improbable)	**2** (Occasional)	**3** (Probable)	**4** (Frequent)
		Frequency			

The risk matrix is divided into three risk categories:

High Risk: Unacceptably high.
The level of risk exposes the company to intolerable injuries to people, and loss of assets, or reputation. The hazard should be eliminated or its risk reduced to tolerable level immediately.

Medium Risk: Acceptable but must be managed.
Risk mitigation measures shall be planned and standardized.

Low Risk: Acceptable without further actions required. Corrective/Preventive actions may be applied according to availability of resources.

The following parameters are used for the assessment of risks:

Frequency of activity

1	Improbable	Has occurred in the Industry on yearly basis.
2	Occasional	Has occurred in ENCOCORP on monthly basis.
3	Probable	Occurs several times on weekly basis in ENCOCORP.
4	Frequent	Occurs daily for several times in the same work area.

Severity of hazard

1	Incidental	Minor injury (First Aid), no or brief disruption of operation, or minor illness with limited or no impacts on the functionality, no treatment required.
2	Critical	Single or multiple minor injuries, local assets damage with partial shutdown, or Health effect with some treatment and/or functional impairments medically manageable.
3	Severe	Single or multiple severe injuries and/or permanent disabilities, major assets damage with partial operation loss or Severe health effect requiring high level medical treatment/management.
4	Catastrophic	Single or multiple Fatalities, extreme assets damage with substantial or total loss of operations or Serious illness resulting fatalities or life shortening.

The result of the analysis shall be recorded on the Risk Analysis Matrix.

4.2 Significant H&S Risks:

Irrespective of risk rating, a non-compliance of statutory and regulatory requirements shall be considered as a significant risk.

Health & Safety Hazards with an inherent risk rating above 8 (≥ 8) are considered as “significant hazards”.

4.3 Management of H&S Risks:

After the risk has been identified and assessed as per the above, the H&S Team should recommend what control measures are necessary to manage the hazard at an acceptable level depending on the nature of the specific hazard(s) (refer to H&S manual).

For Medium and high risks, the H&S committee should define objectives, targets with associated management programme(s) for operational controls to eliminate, substitute or reduce the risk and continually improve ENCOCORP's H&S Management System Performance.

If potential controls require allocation of additional resources, the H&S committee shall submit potential control measures accompanied with required resources to the top management for review, selection and approval

The following hierarchy of control is implemented while identifying and applying controls on risks:

- **Substitution:** Substitute with less hazardous materials, equipment, processes, or substances.
- **Engineered controls:** make appropriate changes to the work environment, work system, tools or equipment, such as mechanical aid/manual handling devices; isolate the hazard through the use of guards or remote handling techniques; provide local or general exhaust ventilation.
- **Administrative controls:** appropriate administrative documents such as policies, guidelines, procedures, registries, work permits, safety signage, job rotations, job timings, routine maintenance and housekeeping; provide training and awareness on hazards and correct work procedures.
- **Personal Protective Equipment (PPE):** Provide well-fitted and properly maintained PPEs and/or protective clothing accompanied with training for their use.

4.4 Review of the Risk Analysis:

The Risk Analysis shall be reviewed at least once a year to ensure its adequacy.
Periodic review of the Risk Analysis including existing control measures shall be conducted in the following situations, but not limited to:

- Changes or proposed changes in the company, its activities, processes, equipment, infrastructure, products or materials prior to their introduction;
- Modification to the H&S management system, including temporary changes having impacts on operations, processes, and activities;
- Findings of internal audits or inspections, monitoring and measurement results, and/or increasing incidents rate;
- Changes in applicable H&S related laws, regulations and other requirements.

5. H&S division roles & responsibilities

Safety department / manager/supervisor/inspector			
Division of responsibilities	manager	Supervisor	Inspector
Unsafe condition - STOP WORK	X	X	X
Ensure a safe workplace environment without risk to health.		X	X
Co-ordinate the development of health & safety policy, and work procedures.	X	X	X
Ensure that all Health & Safety policies, procedures, rules and regulations are adhered to and are regularly reviewed, updated and communicated.	X		
Ensure the Company meets its H&S policy objectives.	X		
- Ensure the completion and regular review of risk assessments for all work equipment and operations.	X		
- Ensure that all incidents are documented, investigated and recommended improvements implemented.	X		
- Conduct safety inspections as per the procedure;		X	X
- Confirms with the customer the presence of fire drills and fire alarms and participates in the awareness conducted on the evacuation system;		X	X
- Assures the daily conduction of the tool box sessions for the staff concerning all H&S issues:		X	X
o The procedures are well known		X	X
o The usage of the PPEs		X	X
o The evacuation plan and the procedure for evacuation	X		
- Conducts awareness to all site visitors and Accompany them	X		
- Ensure adequate health and safety documentation system is maintained.	X	X	
- Establish a program of health & safety training throughout the Company.	X	X	
- Assures the communication with the customer's safety officer;	X	X	
- Manage the H&S committee's minutes of meeting including:		X	X
o Meeting agenda	X		
o Meeting decisions	X	X	
o Improvement Program development		X	X
- Follows up on the implementation of the action plan	X	X	
- Monitor all relevant health, safety & welfare at work legislation and communicate relevant changes to the committee.			X
- Provide regular reports to the H&S Committee on relevant health and safety activities.			X
- Conducts the consultation meetings with employees to discuss the details of H&S		X	
- Liaise with interested parties to assure the presence of all H&S necessities.	X	X	
- Evaluate the suppliers and service providers	X	X	
ny other reasonable duties which may be required by management from time to time.			

ENCOCORP safety handbook edition 4			
1. To advise line management in order to assist it to fulfill its responsibilities for safety including:			
1.1 Ways to prevent injury to personnel, damage to plant or equipment and fires.		X	X
1.2 Ways to improve existing work methods.		X	X
1.3 Legal and contractual requirements affecting safety, health and welfare.	X		
1.4 Provision and use of protective clothing and equipment.		X	X
1.5 Potential hazards on site before work starts and on the safety organization and fire precautions required.	X	X	
1.6 Changes in safety requirements.	X		
2. To advise on safety aspects in the design and use of the plant, equipment and checking of new equipment before commissioning.	X	X	
3. To carry out periodic inspections to identify unsafe areas, working conditions, practices and to report on the results of such inspection and make recommendation for remedying any defects found.		X	X
4. To advise upon, the drawing up and implementation of safe systems of work and use of protective equipment.	X	X	
5. To carry out site surveys to see that only safe work methods are in operation, that health and safety requirements are being observed and that welfare and first aid facilities are adequate and properly maintained.		X	X
6. To determine the cause of any accident (or dangerous occurrence), and recommend means of preventing recurrence of each and any incident.		X	X
7. To take part in the discussions on injury, damage, and loss control.	X	X	X
8. To supervise the recording and analysis of information on injuries, damage and production loss. Assess accident trends and review overall safety performance.	X	X	X
9. To keep up to date with recommended codes of practice and safety literature. Circulate information applicable to each level of employee.	X	X	
10. To provide information about accident prevision techniques and preparing necessary signs of safety.		X	X
11. To attend job progress meetings where safety is an item on the agenda. Report on-job safety performance.		X	
12. To ensure that work is carried out within safety regulations (He shall be a member of the safety committee) To keep a record of every meeting complete with subject discussed and list of attendees.		X	X
13. To keep people free from danger, risk, or injury in the workplace and to minimize losses due to injuries and property damage by implementing damage control as an integral part of business and operational efficiency.	X	X	X
14. To Assist with training sessions of employees at all levels.		X	X
15. To set a personal example.		X	X

6. Communication, participation & consultation procedure

6.1 Health and Safety Consultation

ENCOCORP shall consult with employees through regular staff meetings and will nominate health and safety supervisor, which will represent the designated workgroup.

The Health and Safety supervisor, in no way removes the obligation on management to ensure the health and safety of employees, contractors, clients or visitors to the workplace.

The role of the health and safety supervisor is to form a joint management/team consultative group, with the aim of identifying and resolving occupational health and safety issues, as well as working towards improved standards in health and safety and continuous improvement within the OH&S Management System.

The health & safety supervisor will meet regularly with management and employees. Copies of the meeting's minutes shall be made accessible to the designated workgroup.

The employees within the designated workgroup shall have access to discuss health and safety issues with the Health and Safety supervisor, when required.

6.2 Health and Safety Team

ENCOCORP supports the training and active involvement of health and safety consultation through management and designated workgroup (department employees).

A- The Health and Safety Team will consist of:
- ✓ Management representative: Mr. Khatchig Khatchadourian
- ✓ H&S Manager – Mr. Aalex Dermossissian
- ✓ H&S supervisors - Mr. Medhat Hassan
- ✓ H&S inspectors: - Mr. Pancho Villa

B- The Management representative will represent the designated team during H&S committee meetings.

C- The management representative will have the authority, to implement preventative measures and act on behalf of the organisation on matters associated with health and safety.

D- Health and safety team is nominated by project.

6.3 Training

Health and safety team members shall attend a health and safety training program, as soon as they have been nominated. Health and safety representative training will be as per the requirements of the OH&S.

6.4 Organising and conducting meetings

Health and Safety Meetings between the H&S committee-and the representatives are to be held at least once every three months. In the event of an incident, a meeting will be held as soon as possible to investigate the incident and put into place measures to reduce the hazard.

The following outlines the scope of the health and safety meetings:

- Analysis and discussion of injury/illness/incident reports and accident investigations;
- Reports from workplace inspections;
- Discussion of Health and Safety concerns raised by employees;
- Follow-up on previous recommendations;
- Review of the "Injury Register";
- Health and Safety awareness;
- Implementation of Policy and Procedures;
- Matters relating to Housekeeping, fire prevention, protective equipment.

Agenda

A meeting agenda must be prepared and sent to the relevant persons prior to the meeting. It will list the matters to be discussed, who will attend, time, date and location of the meeting and have attached to it any documents to be reviewed prior to the meeting.

Minutes of Meetings

All items, which require action, should be numbered so that they are uniquely identified. The numbering should be consecutive and follow on from the last action item of the previous minutes. For each action item a responsible person and proposed date for completion of the action should be nominated.

Minutes shall be published within 3 working days following the completion of the meeting by the health and safety representative or the delegated person.

6.5 Health and Safety Communication Process

ENCOCORP is committed to maintaining a safe and healthy working environment for all concerned parties and would ensure that any complaint is dealt with in constructive manner.

In attempting to resolve a matter that may be a risk to health and safety, the representative must use the applicable health and safety consultation arrangements and formally refer the matter to the manager**.** Management will consider the matter and respond in a timely manner.

6.6 Safety Meetings

ENCOCORP will ensure that regular safety meetings are held with all employees. They are held on a daily basis and health and safety issues must be raised as part of the general staff meetings.

Such meetings will take the form of a short information-sharing forum for short-term issues and concerns regarding health and safety in the workplace. No other non-safety related issues are to be discussed during this time. All such meetings shall be documented. A copy of every meeting shall be kept and displayed in a prominent place.

Actions arising from these meetings shall be documented and displayed in the workplace, with the information being regularly updated.

6.7 Safety Awareness

ENCOCORP is committed to safety awareness. As part of this commitment, the OHS Management System Manual and policy will be made fully available to all concerned parties.

General safety awareness exercises will be conducted regularly throughout the year. These will involve both employees and management, and are designed to raise everyone's awareness of health and safety issues within the workplace.

7. Documented information management

7.1 New Document Request Reception

Creation of new document(s) or improvement of old version(s) shall be requested based on industry-related legislative updates or new project implementation. The request is presented to the H&S committee in one of the following ways:

- ✓ changes in norms and regulations of the country;
- ✓ new project: by the H& S committee based on the project H&S requirements;
- ✓ Improvement request: by the designated management representative of the Project.

7.2 Validity review of requests

As soon as the H&S committee gets the request, at their earliest convenience must review the document with the responsible person for the corresponding field to decide the necessity of the document. If there is no need of the requested document, the H&S committee rejects by specifying the reason of rejection.

If the document request is approved, a transition is made to the next step.

7.3 Document creation/modification planning

The H&S committee and the responsible person for the corresponding field discuss and appoint the editor along with document modification deadlines.

7.4 Document creation/modification

After receiving the assignment & instructions the editor must create the new requested document or edit the existing document.

All procedures of ENCOCORP are included in this manual, for any newly created document it should have the following structure:

- ✓ Purpose and Scope of activity defining the main purpose and scope of activities covered in the document;
- ✓ Diffusion defining responsible user(s);
- ✓ Abbreviations used in the procedure;

- ✓ References are documents that are used as a reference while developing the procedure;

- ✓ Description of the activities, eventually GA drawings;
- ✓ Notes specifying modification applied to the previous editions;
- ✓ Annexes.

Based on the above mentioned elements the editor creates/edits the document and transfers it to the H&S committee for review & approval. Documents are created in English.

7.5 Review & approval by the Customer

The designated management representative submits the newly created or edited documents to the customer for review. In case of any remarks, the document is returned to him to apply the recommendations, otherwise, the document is approved.

7.6 Updating the diffusion matrix and diffusion of the new document

The management representative updates the Diffusion Matrix by inserting the below data about the new document:

- ✓ Document name;
- ✓ Code;
- ✓ Edition;
- ✓ Diffusion;
- ✓ Application Date;
- ✓ Archiving date and place (in case of registration and forms).

The management representative shares the PDF version of approved document(s) in the organization and sends e-mails to concerned personnel.

If the document has an old edition, the project manager removes all old versions.

The original copy is archived in accordance with the dates mentioned in “Diffusion Matrix”.

7.7 Archiving

All documents in ENCOCORP should be diffused, retained and archived according to the dates mentioned in “Diffusion Matrix“. If the defined retention period of the document in the “Diffusion Matrix” exceeds, documents should be archived. The archived documents are kept and saved in the designated server. The hard copy of the documents will be archived in a well-tempered room.

At the end of each project the H&S committee reviews the necessity of archiving or disposal of documents.

The documents, which has a legal impact should be kept till the final judiciary decision.

The soft copies of documents are archived in the server or mirror HDD, within relevant folders to departments.

7.8 Documentation Diffusion Review

The management representative shall review "The Diffusion Matrix" of ENCOCORP as necessary and make changes, if needed.

"The Diffusion Matrix" shall include Company's external documentation, also to be managed similar to the internal documentation.

8. Operational control procedures

All operational control procedures are addressed as per the implemented quality management system according to ISO 9001:2015 standard requirements including the Human resources, purchasing and the maintenance.

The main control measures identified during hazard identification and risk assessment are the following:

8.1 TRAFFIC PLAN

1- GENERAL:
   a. A Traffic Plan shall be submitted as a separate document which will indicate all access routes, parking areas and areas where traffic restrictions apply, e.g. height, width and weight restrictions.

   b. The Traffic Plan shall include a schedule of construction showing each part of the work and anticipated method of handling road closures, and scaled drawing of the street, lane configuration, side walk relative to the proposed worked area.

2- ROAD CLOSURES:
   a. Any requirements for road closures will be documented on a "Request for Road Closing". This form will be submitted for the Client review and approval prior to any required closure.

3- GENERAL:
   a. Only designated access routes shall be used in accordance with approved Traffic Plan.
   b. In-plant parking shall be permitted only in designated parking areas.
   c. Driver shall comply with all posted traffic regulations at all times.

4- REFERENCE:
   DRAWING: TO BE GIVEN LATER

8.2 DESERT DRIVING

1- GENERAL:
   a. It is not anticipated that any desert driving will be required during this project. However, in the event that this becomes necessary, the following procedure shall apply.

2- VEHICLE:
   a. Only 4-wheel drive vehicles fitted with sand tires are permitted to be used for desert driving.
   b. The vehicle must be in good condition and fully supplied with adequate fuel, oil and water
   c. Vehicle must contain spare tire, Jack and tools, etc.

3- DRIVER:
   a. Driver must hold valid driving licenses.
   b. Driver must have received training in off- road driving, and must be familiar with survival and rescue techniques.
   c. Driver must carry either a mobile phone or a radio.

4- PRACTICE:
   a. Before setting off, the driver shall notify his immediate supervisor of his intended route, destination and expected time of arrival.
   b. Driver shall drive within his own limits and the limits of the vehicle at all times.
   c. Using mobile phone or radio, driver shall inform his supervisor of any changes
   d. To planned itinerary.
   e. Upon arrival at destination, driver shall inform supervisor.

5- SEARCH AND RESCUE:
   a. In the event of an accident or breakdown, driver shall stay with vehicle and shall contact supervisor to inform of his status and location.
   b. If driver does not report to his supervisor within one hour of expected arrival time, the supervisor shall attempt to reach the driver by mobile phone or radio.
   c. In the event that contact is not made with the driver, a second vehicle shall be dispatched along the original route from the last known location. This vehicle shall report every 30 minutes the approximate location and the distance traveled.
   d. The rescue vehicle shall be equipped with a first aid kit, and shall carry a nurse and a mechanic.
   e. In the event that the rescue vehicle is unable to locate the missing vehicle then the civil defense authority shall be notified and their assistance sought.

8.3 WORK PERMIT

1- GENERAL:
   a. All activities performed within the project shall be executed only after obtaining appropriate 'Work Permits' based on customer requirement.
   b. The non-routine activities executed shall have a work permit.
   c. The activities in 'Restricted areas' shall be performed only under supervision and work executed by qualified craft personnel.
   d. The Site Safety Supervisor will conduct daily work permit audits to ensure all stipulated conditions on the permit are complied with. The audit will be documented on the work permit audit sheet. It will be available for review by the ENCOCORP representative.

8.4 WELDING AND CUTTING EQUIPMENTS:

1- BASICS:
   a. Make sure that the welding equipment is installed properly, grounded, and is in good working condition.
   b. Always wear protection clothing suitable for the welding to be done.
   c. Always wear protection when welding, grinding or cutting.
   d. Keep your areas clean and free of hazards. Make sure that no flammable, volatile or explosive materials are in or near work area.

e. Handle all compressed gas cylinders with extreme care. Keep caps on cylinders when not used or during handling.
f. Make sure that compressed gas cylinders are secured to the wall or to other adequate structural support.
g. When compressed gas cylinder is empty close the valve, mark the cylinder "empty" and segregate.
h. Do not weld on containers that have held combustibles without authorization and exercising extreme precautions (Safety Permit).
i. Do not weld on closed containers or compartment without necessary ventilation and taking special precaution.
j. Use mechanical exhaust at the point of welding when welding or brazing lead, aluminum, cadmium, chromium, manganese, brass, bronze, zinc or galvanized steel.
k. When it is necessary to weld in a damp or wet area, wear rubber boots and stand on dry insulated platform.
l. If it is necessary to splice lengths of welding cable together, make sure all electrical connections are tight and insulated, do not use cable with frayed, cracked, or bare spots in the insulation.
m. When electrode holder is not in use, hang it on brackets provided that it is never let to touch a compressed gas cylinder.
n. Dispose of electrode stubs in a proper container since stubs on the floor are safety hazard.
o. Shield others from the light rays produced by your welding arc.
p. Do not weld near degreasing operations.
q. When working above ground, make sure that scaffold ladder or work surface is solid.
r. When welding in high places without railing, use safety belt or lifeline.
s. When using water- cooled equipment check for water leakage.
t. Make sure that all your gas apparatus are UL or FM approved and are installed properly and are in good working condition. Make sure that all connections are tight before lighting the torch. Do not use a flame to inspect for tight joints. Use soap solution to detect leaks.
u. Keep cylinder in a vertical position.
v. Store compressed gas cylinder in a safe place with good ventilation (outside the building in shielded areas).
w. Acetylene cylinders and oxygen cylinders should be kept apart.
x. Flame cutting sparks can travel 30-40 feet. Do not allow flame out sparks to hit hoses, regulator or cylinder.
y. Oxygen should not be used for air in any way.
z. Use appropriate torches and only for the purpose intended.
aa. Never use acetylene at pressures in excess of 15(p.s.i.). High pressure, can cause explosion.
bb. Never use oil, grease or any material on any apparatus or threaded fitting in the oxy/acetylene or Oxy-fuel gas system - oil and grease in contact with oxygen may cause spontaneous combustion.
cc. Treat regulators - valves with caution- do not turn valve handle using force.
dd. When assembling apparatus, crack gas cylinder valve before attaching regulators. This will blow out any accumulated foreign material. Make sure that all threaded fittings are clean and tight.

2- ALWAYS USE THIS CORRECT SEQUENCE AND TECHNIQUE FOR LIGHTING TORCH:

a. Open acetylene cylinder valve.
b. Open acetylene torch valve ¼ turn.
c. Screw an acetylene regulator. Adjusting valve handle working pressure.
d. Turn off acetylene torch valve (you will have purged the acetylene line).
e. Slowly open oxygen cylinder valve all the way.
f. Open oxygen torch valve ¼ turn.
g. Screw the oxygen regulator to working pressure.
h. Turn off oxygen torch valve (you have the oxygen line purged).
i. Open acetylene torch valve ½ turn and light with lighter (use friction type lighter or special provided lighting device only).
j. Open oxygen torch valve ¼ turn again.
k. Adjust neutral flame.

3- ALWAYS USE THIS CORRECT SEQUENCE AND TECHNIQUE OF SHUTTING OFF A TORCH:

a. Close acetylene torch valve first then close oxygen torch valve.
b. Close cylinder valves. The acetylene valve first-then the oxygen valve.
c. Open acetylene and oxygen torch valves to release the pressure in the regulator and hose.
d. Back off regulator adjusting valve handle until no spring tension is felt.
e. Close torch valve.

4- INSPECTION OF EQUIPMENT:

a. All equipment should be examined immediately before use and regularly maintained. All welding operations shall be conducted in well-ventilated areas.
b. Only soapy water should be used to check for leaks. Presence of a leak is often indicated by a hissing sound or unusual changes in the torch flame. Cylinders and valves should be kept clean. Valve sockets shall be kept free of grit, dirt, grease or oil.
c. Hoses should be used for one type of gas only and color coded for identification. They should be examined before use of any signs of splitting which might give Rise to leak. All connections should be made by clips or crimps. The hoses used for acetylene and for oxygen shall not be interchangeable.
d. Cylinders in use should be kept upright on a custom-built stand fitted with a bracket to accommodate the hoses and equipment or otherwise secured. The metal cap should be kept in place to protect the valve when the cylinder is not connected for use.
e. Connections and check valves should be regularly examined. Equipment should be fitted with the correct pressure regulators and a regular check should be made to ensure that the regulator is working properly. The torch nozzle should be kept closed.

5- STORAGE OF CYLINDERS:

a. Cylinders should be stored in a safe, dry, well-ventilated place prepared and reserved for that purpose.
b. Flammable substances such as oil and volatile liquids or corrosive substances should not be stored in the same area.
c. Oxygen cylinders and flammable gas cylinders shall be stored separately, at least 6.6 meters apart or separated by a fire proof, 1.6 meters high partition.
d. All storage areas shall have Arabic and English "No Smoking Permitted" signs prominently displayed.
e. All cylinders should be chained or otherwise secured in an upright position.
f. To prevent rusting, cylinders stored in the open should be protected from ground contact, extremes of weather, or contact with water. Valve caps shall be kept in place when cylinders are not in use.
g. Cylinder storage should be planned so that cylinders will be used in the order in which they are received from the supplier.
h. Empty and full cylinders must be stored separately with empty cylinders plainly marked as such, to avoid confusion. Empty cylinders should be segregated according to the type of gas they have held.

6- HANDLING OF CYLINDERS:

a. Cylinders shall never be lifted by their valves since the valves are not designed to take such stress. When the cylinder is not in use, the valve shall be protected with the valve cap. All valves should be fully closed before a cylinder is moved. Unless a trolley or special carrier is used, regulators and hoses should be detached from the cylinders, for moving.
b. If cylinders are to be lifted by a crane, specially designed bottle holders with lifting eyes should be used. Chain and wire rope slings can allow cylinders to slip. Where a trolley is to be used for slinging, its base should be strong enough to take the weight of the cylinders. Do not lift a cylinder with an electromagnet.

7- COLOR CODING OF CYLINDERS:

a. Color coding can be of great help but also a potential source of danger as there is no internationally recognized standard color code.

8- WELDING AND CUTTING: TANKS, VESSELS AND DRUMS:

a. Careful tests should be made to establish that the tank, vessel or drum is free from explosive flammable vapors or substances. The responsible supervisor should make a check before permitting any work to begin. It is essential that past contents of the tank, vessel or drum be identified. If there is any doubt or if the tank is known to have had any kind of flammable or explosive content, it should be cleaned and purged thoroughly prior to welding or cutting. Extreme care should be taken in considering methods of tank welding and cutting since these are hazardous operations unless correct safety measures are taken.
b. Cleaning and purging procedures shall be approved by the safety engineer before any progress of works.
c. No work shall commence before a "WORK PERMIT" authorized by the concerned safety entities is issued

9- PROTECTIVE MEASURES

a. Keep all doors, covers and panels in place when operating the machine: The Arc welding machine is designed to operate with all its doors, covers and panels in place. They ensure the optimum flow of cooling air, and removal of theses covers and panels will reduce the cooling of the engine and generator, resulting in overheating and premature failure of the unit.
b. Ensure that the engine protection push button 'pops out' when the engine is switched off. Under normal circumstances, this button will 'pop out' once the engine is switched off. However, if the unit becomes clogged with dirt, dust or sand, it may not return to its 'off' position without assistance. If the button remains depressed, it will quickly drain the unit's battery. This will cause the delay of your work while a new battery is fitted, a 'jump start' arranged, or a recharge cycle is completed.
c. Maintain welding and ground cables and connections in good condition. A major source of safety hazards, poor and inconsistent welding performance, and loss of point-of-use welder capacity is a set of welder leads in poor condition, or of the wrong size for the length of cable being run.
d. When welding is in progress, the full length of cable must be stretched out on the ground. Leaving the cable coiled on the machine alters the current flow and disrupts the welding process.
e. Do not adjust the 'current control' while welding is in progress. This can damage the control.
    - ✓ Sparks and molten or hot metal coming from the work area can easily set fire to combustible materials near or below the working area. All combustible material shall be removed from the work area. If it cannot be removed, it shall be covered with fireproof material. Gas cylinders shall be protected from falling sparks.

10- PERSONNEL PROTECTION:

a. Helmets, welding hoods, and goggles are necessary to protect eyes and face against heat and the effect of the intense light emitted by welding operations.
b. Goggles are required to protect the eyes of the welder from pieces of flying slag chips during electric arc welding. They shall be fitted with opaque side pieces. These goggles shall also be worn under the regular welding hoods.
c. Electric welding operations must be effectively screened to prevent nearby personnel from being affected by harmful radiation. Screens shall be made from fire resistant materials or shall be suitably treated with a fire resistant compound. Screens shall be designed and placed so as not to restrict the flow of air for ventilation purposes.

11- HEALTH HAZARDS:

a. The process of welding produces radiant energy in the form of visible light, ultra-violet rays. The risk of this energy harming the operator or other personnel can be minimized by the proper use of protective clothing and shielding. Exposure of the skin to infrared and ultraviolet rays can result in irritation and burning. The risk of exposure is lessened by wearing protective clothing, shielding and distance.
b. Arc-eye or flash burn is a well know condition in welding operations and is due to the eyes being exposed to ultraviolet rays. This condition is a superficial burn on the outer layer of the eye.

c. Notes:
- ✓ Splicing of cable is not allowed.
- ✓ Use of safety belt is prohibited inside a refinery.
- ✓ Flashback arrestor must be fitted on both regulator and torch side of the oxy-acetylene set.
- ✓ Oxy- acetylene set must be covered with fire blanket to protect from falling sparks.
- ✓ Leather aprons, elbow-long welding gloves and gauntlets must be used by welders to protect them from burns.
- ✓ Fume mask must be issued to welders.

8.5 PERSONNEL PROTECTIVE EQUIPMENT

1- GENERAL:
- a- The minimum personal protective equipment (PPE) to be issued to all personnel are:
  - ✓ Coverall.
  - ✓ Safety shoes/boots.
  - ✓ Safety helmet.
  - ✓ Gloves.
- b- Other personal protective items are dependent on the type of work to be carried out.
- c- All PPE issues are to be approved by the HSE Officer and recorded in a register.

2- COVERALLS:
- a- It is the employee's responsibility to ensure that coveralls are kept clean and are in a good condition.

3- SAFETY HELMETS:
- a- Management/supervisors shall wear WHITE hard hats. All workers shall wear BLUE helmets. Safety Personnel shall wear RED Safety Hard Hats.
- b- Safety helmets shall comply with standards.
- c- Safety helmets shall not be painted or altered in any way.
- d- Safety helmets shall be worn at all times on the site, with the brim to the front.
- e- The internal support frame shall be in a good condition and it should fit comfortably.
- f- The helmet shall be replaced if it is defective in any way or if it has received a severe impact.

4- SAFETY SHOES:
- a- Safety shoes/boots MUST be worn at all times on site.
- b- They should have steel toecaps and resilient rigid soles, with adequate tread.
- c- The uppers should be clean and in good condition.

5- HAND PROTECTION:
- a- Short cloth gloves are the standard basic issues for protection against abrasions.
- b- Specialized gloves shall be issued depending upon tasks to be carried out.

6- EYE AND FACE PROTECTION:
   a- Protection for the eyes and face is required for physical, chemical and light radiation dangers.
   b- The type of protection required is dependent on the task to be carried out.
   c- Safety glasses with side shields are mandatory at all times.

7- FOOT PROTECTION:
   a- Safety footwear is available in different styles with special soles to resist oil, abrasion, heat, and other abuses to which the foot wear may be subjected. It must be comfortable and fit properly for the wearer.
   b- Approved safety footwear are with leather uppers or leather with steel toe caps. Soles and heels are non-slip type.

8- HEARING PROTECTION:
   a- More attention should be paid to the problem of excessive noise in the industry. Hearing loss will result from over exposure to excessive noise levels. Consideration must be given to providing hearing protection to the work men individually.
   b- Two types of hearing protection are available. The plug type and the cup (or muff) type.
   c- Hearing protection (earplugs or muffs) shall be used in areas where relevant signs are displayed.
      ✓ **Ear plugs** are placed in the canal of the outer ear. Material used for these plugs are rubber, plastic, wax, foam or Swedish wool. Disposable type is preferred as they give good protection and are very sanitary.
      ✓ **Ear Muffs** cover the external ear to provide acoustic barrier. The effectiveness **varies** due to the size, shape, seal material, shell mass, and type of suspension. The use of hearing protection devices shall be properly evaluated to ensure that the selected devices give the necessary noise attenuation and protection.
   d- Ear protection must be worn by all persons entering areas where sound levels exceed 85-dB (A) even for short periods of time.

9- FALL RESTRAINING / ARRESTING DEVICES:
   a- The two most commonly used fall restraining devices are the Full body safety harness and the Safety belt.
   b- Harness are used for above ground work, where fall restraining and arresting protection is required.
   c- Safety belts are used to restrain the wearer at his place of work. Safety belts should not be used as a part of the fall arrest system.
   d- Full body harnesses are required when working in areas with no guard rails at heights above 1.82 meters or for potential falls of six feet or greater.
   e- Special attention should be given to achieve a snug fit of the safety harness as it is easy for a man to slip through sound but badly adjusted equipment and fall.
   f- No fall restraining or arresting device is any stronger than the point of attachment therefore all users should be carefully instructed in the importance of a firm anchorage.
   g- Fall restraining / arresting devices must be stored in clean and dry conditions away from sun light and must be thoroughly inspected both on issue and at the start of each shift.

h- Fall protection devices shall be capable of supporting a minimum dead weight of 2450 kilograms (5400 pounds).
i- During all operations conducted from a personnel platform at any height above ground level, fall protection devices shall be secured to an anchorage point or a structural member located on the basket which can support a minimum dead weight of 2,450 kilograms (5400 pounds).

8.6 TOOL AND PORTABLE POWER TOOLS:

1- BASICS:
a- All tools shall be maintained in a good condition.
b- The usage of all tools shall be in accordance with the ENCOCORP safety manual.
c- Tools shall only be used for the intended purpose.
d- Tools (in particular power tools) shall only be utilized by trained and competent Personnel.
e- Portable power tools shall not have a voltage rating greater than 125 Volts.
f- Hand tools are those for which the hand provides the motive force, e.g., picks, shovels, axes, crowbars, wrenches, saws, chisels, hammers, screw drivers, etc. It is the duty of the supervisor to ensure that his workmen are properly instructed in the selection and use of the correct tool for the job. Tools constructed of good quality should be used. Poor quality tools increase the risk of accidents and also reduce the efficiency of work.
g- No handmade tools are to be used.

2- HAND TOOLS: GENERAL:
a- Quality:
- ✓ The finest quality tools should be provided for all jobs where hand tools are used.

b- Cleanliness:
- ✓ The hand tools are regularly cleaned and where necessary, lightly oiled as a protection against corrosion.

c- Selection:
- ✓ It is essential that the correct type, size, and weight of tool should be decided upon before any work is carried out.

d- *Electrical risks:*
- ✓ If work takes place on or near the electrical operations, only properly insulated and non-conductive tools should be used. Insulation should be checked at proper intervals.

e- *Repair and storage:*
- ✓ All hand tools should be regularly inspected before and after use. If wear and damage is observed, the tools should be withdrawn from use for repair or disposal. The storekeeper maintains a record of all the tools issued, repaired, and with drawn from use.

3- INDIVIDUAL HANDTOOLS PRECAUTIONS:

a- Screwdrivers:

- ✓ It is essential that the correct size of tip to fit the slot of the screw. Over tightening of the screws can lead to possible hand injury if the screwdriver slips.
- ✓ Screwdriver shanks are not designed to withstand the twisting strain applied by a pair of pliers or more grips in order to obtain additional leverage. On no account should screwdriver handles be subjected to blows from a hammer or similar instruments.
- ✓ Screwdrivers should never be carried in the pockets of coveralls or other clothing. A screwdriver can produce a serious wound.

b- Hammers:

- ✓ It is essential that the right kind of hammer be selected for the job. Hammer handles be made from smooth timber or be made of an integral head and shaft of steel. Hammerheads should be secured to wooden handles with proper wedges.

c- Chisels:

- ✓ Cutting edges should be kept sharp at all times and the original shape and angle should be maintained. Re sharpening cold chisels should be suitably hardened and tempered to maintain them in a safe working condition. The chisel heads will mushroom in use.
- ✓ As soon as mushroom is observed the head should be reground with a slight taper around the edge to prevent chipping and reduce the tendency to re mushroom. Eye protection should be worn at all times when a cold chisel is used.
- ✓ On jobs where it is necessary to use a sledgehammer for striking the chisels, the chisel should be held by a second person using a pair of tongs.
- ✓ Wood chisels should also be maintained in a sharp condition so that minimum pressure is exerted when cutting a cut. If the chisel is to be struck only a wooden or soft mallet should be used.

d- Spanners and Wrenches:

- ✓ Only spanners and adjustable wrenches of the right size should be used when possible. Use box end rather than adjustable wrenches. The jaws should be checked for any sign of opening out or splitting. Spanner and wrench lengths are graded to provide sufficient leverage on the nuts for which they are designed. Improvised extension to these tools is an unsafe practice and may cause the bolt tread to trip or cause shearing of the bolt. On no account should ordinary wrenches be struck by a hammer when tightening nuts. For heavy work of this nature, a properly designed slugging wrench should be used.

e- *Pipe Wrenches:*

- ✓ It must be large enough for the job. The jaw teeth must be kept clean and sharp and the knurl pin and spring should be kept free from damage. Pipe wrenches should never be struck with a hammer nor should they be used as hammer.

f- Picks and shovels:

- ✓ Picks and shovels shall be maintained in a serviceable condition at all times. Shovel blades should not be allowed to become blunt, turned, split, or jagged. Pick head points should be kept sharp and heat treated so that the metal wears down in use and does not splinter or chip off. Shafts of picks and shovels should be kept free from cracks and splinters.

g- Pliers:

- ✓ Pliers should be used when there are no other tools for the job. They are meant only for gripping around objects and should not be used as a wrench.
- ✓ Care should be taken when cutting soft metal with pliers to ensure the scrap portion does not fly off and cause injury. If wire is cut under tension, then long handled pliers should be used. Where pliers are used for electrical work, they must be fitted with insulated handles. All pliers should be kept free from dirt and grit and the movable parts should be lightly lubricated.

h- Hacksaws:

- ✓ The correct type of blade should be selected to suit the material to be cut. The blade should be set in a hacksaw frame so that the teeth are pointing in the forward direction, and sufficient tension should be applied to ensure blade is maintained rigid.

i- *Handsaws:*

- ✓ Many kinds of wood working handsaws are available and care should be taken to select the correct saw. All handsaws shall be regularly examined to ensure that the saw teeth are properly set so as to avoid binding in the timber, which can cause the blade to buckle. The teeth should be kept sharp, clean, and lightly oiled. When the saw is not in use the blade should be protected by a slotted piece of timber or a sheath.
- ✓ Two man saws should be operated by pulling only. The cut should be kept straight to avoid the blade buckling. The cut should be wedged open to prevent the timber from pinching the blade.

j- Jacks:

- ✓ Jacks should be marked with rated capacity and must be heavy enough and strong enough to raise and maintain the load. They should be placed on a firm and solid support and the load should be positioned on the center line of the jack.
- ✓ Once the load has been raised it must be shored or blocked. The jack should never be relied upon to hold the raised load in position by itself. Extreme care should be taken when working under or near a raised load.

4- POWER TOOLS – GENERAL:

a- Quality:

- ✓ The contractor shall ensure that all portable power tools in the range of 110-220 volts rating, are manufactured of sound materials and are free from defects and are properly grounded.

b- Repair and storage:

- ✓ All portable power tools shall be stored in clean and dry conditions. All the tools should be returned to the store after the completion of each job. Power tools must not be left lying around the job site where they could be damaged.

- ✓ Rotating tools should be switched off and held until rotation has completely stopped before they are set down. Tools must be disconnected before changing bits, blades, cutters, or wheels.

5- PNEUMATIC TOOLS:

a- General:

- ✓ An air compressor shall always be under the supervision of a competent person. It should always be suited in such a place so as to have adequate ventilation.
- ✓ Compressors shall not be permitted to operate in confined spaces without the provision of adequate exhaust ventilation.
- ✓ Pneumatic tools require clean air to operate efficiently. In every main line feeding power tools, an adequate filter and lubricator must be made available.
- ✓ During operation, all air tools should be held firmly to prevent them spinning and jumping. This pressure should be maintained during the stopping process to prevent injury to the operator's feet and hands.
- ✓ All compressed air hoses shall be of the correct size to fit the tool being used. Any joint in the hoses shall be made with a proper coupler and secured by safety wire. The hose length shall be kept as short as possible and placed so as not to be subjected to any damage.

6- INDIVIDUAL TOOLS PRECAUTONS:

a- Jack Hammer and Concrete Breakers:

- ✓ The tool bit retaining spring shall always be securely fit in position to prevent the bit from dropping out. The bit must be kept sharp.
- ✓ Ear, eye and foot protection shall be required when working with this type of equipment.

b- Rock Drill:

- ✓ It is extremely important that the operator maintains a firm grip with both hands and stands in a balanced position. Any other method of using the tool can cause serious bodily injury.

c- Grinding Machine:

- ✓ This tool is probably the most misused of all the power tools. Care shall always be taken to ensure that the grinding wheel is free from defects before mounting. Any defect may cause the wheel to disintegrate as it gains momentum.
- ✓ Only persons who have been instructed in the proper selection and fitting of the wheels should be allowed to install wheels on tools.
- ✓ The proper size and type of wheel should be fitted to the tool so that the maximum permissible running speed of the spindle does not exceed the maximum periphery speed displaced on the grinding wheel. No grinding machine shall be used unless the maximum speed is clearly marked on the case. All wheels shall be fitted with adequate guards in conformance with ANSI B7- 1.

- ✓ Floor stand and bench mounted abrasive wheels used for external grinding shall be provided with safety guards. The maximum angular exposure of the grinding wheel periphery and sides shall not be more than 90 degrees except that when work requires contact with the wheel below the horizontal plane of the spindle the angular exposure shall not exceed 125 degrees. In either case the exposure shall begin not more than 65 degrees above the horizontal plane of the spindle. Safety guards shall be strong enough to with stand the effect of a bursting wheel.
- ✓ Floor and bench mounted grinders shall be provided with work rests which are rigidly supported and readily adjustable. Such work rests shall be kept at a distance not to exceed one eight inch from the surface of the wheel.
- ✓ Cut type wheels for external grinding shall be protected by either a revolving cue guard or a band type guard in accordance with the provision of the American national standards institute, ANSI B7.1 safety code for the use, care, and protection of abrasive wheels. All other portable abrasive wheels for external grinding shall be provided with safety guards meeting the requirements of this paragraph, except as follows:

    1. When the work location makes it possible, a wheel equipped with safety flanges shall be used.
    2. When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.
    3. Portable abrasive wheels used for internal grinding shall be provided with safety flanges except as follows:

        a) If the wheels are entirely with in the work being ground while in use.
        b) When wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel are used.

- ✓ When safety guards are required, they shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastening shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180 degrees.
- ✓ When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges of a type and design shall be used and properly assembled so as to ensure that the pieces of the wheel will be reduced in the case of an accidental breakage.
- ✓ All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects.
- ✓ Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place.
- ✓ All employees using abrasive wheels shall be protected by eye protection equipment.

- ✓ Materials that require grinding shall be placed on the tools rest with moderate head on pressure applied. Materials should not be forced or jammed into the wheel. Grinding the materials on the sides of the wheel is an unsafe practice which can damage the wheel. A grooved or damaged wheel must be replaced.

8.7 LADDERS:

The safety of the ladder depends on four important factors: ***selection, condition, position*** and ***use***. Ladders shall comply with the referenced ANSI or equivalent codes.

1- SELECTION:

a- A ladder must be of the proper length for the job to be done. If it is to be used for access or as a working place, it shall rise to a height of 36 " – 42 " above landing place or above the highest rung to be reached by the feet of the man using the ladder.

b- Metal ladder, ladders with metal reinforced side rails, and ladders that are wet shall not be used near electrical equipment with exposed live conductors. Such ladders shall have warning notice attached to guard against use near electrical equipment.

c- Aluminum ladder shall not be used where there is a likelihood of contact with material harmful to aluminum, such as caustic liquids, damp lime, wet cement, etc.

2- CONDITION:

a- Each ladder shall be examined before being used. Those with split or broken side rails, missing, broken, loose, decayed or damaged rungs or cleats or with other faulty equipment shall not be used as required in a construction safety manual (Safety requirement for scaffolding).

b- Rungs shall be properly mortised into side rails. Cleats shall be inset by one-half inch, or filler blocks used on the side rails between the cleats. Cleats shall be evenly spaced 12 inches from top to top.

3- POSITION:

a- The side rails of a ladder shall be equally supported on a firm level surface. No other item shall be used as a means of support, e.g., boxes, blocks, barriers, etc. The area at the base must be kept clear.

b- Both side rails should be evenly supported at the upper resting place where the ladder is more than 10 feet in length. Side rails shall be tied off to prevent movement.

c- Where there is a danger of a ladder being struck by moving vehicles, a man shall be placed on guard, or the area fenced off.

d- Ladders landing spaces shall be provided every 30 feet and shall be fitted with guard rails and toe boards. Holes in decking shall only be large enough for a man to pass through.

4- USE:

a- When an extension ladder is used fully extended, the minimum overlap depends on the extension ladder length, and overlap should be as followed:

9.75 to 10.97 meters (32 to 36 feet) = 1.22 meters (4 feet) overlap

10.97 to 14.63 (36 to 48 feet) = 1.52 meters (5 feet) overlap

b- Splicing or lashing ladders together **SHALL NOT BE PERMITTED**.

c- Before mounting a ladder, personnel shall check their shoes for freedom from grease, oil or mud. They shall always step through, not around, the rail extension at the top of the ladder.
d- Single rung ladders must only be used by one person at a time. When the ladder is in use the user must face the ladder for ascending or descending.
e- Men descending or ascending ladders shall not carry tools and equipment in their hands. Tools should be carried in their pockets or attached to their belts.
f- Whenever possible ladders should be set at an angle of 75 degrees (one horizontal out to four ups).

5- GENERAL:

a- Ladder and step ladder shall be maintained in a good condition at all times. Joints shall be tight, all hardware and fittings shall be securely attached, and movable parts shall operate freely without binding or undue play.
b- Ladders and stepladders must not be painted.
c- When ladders are carried by one man; the front end should be kept high enough to clear men's head and special care shall be taken at corners and blind spots.

6- LADDER SAFETY:

a- Ladder can be one of our most hazardous pieces of equipment if used improperly. Ladder accidents are caused by carelessness, by misuse, or by defects in the ladder structure. The following rules will ensure your safety when using a ladder:
- ✓ Carry a ladder with the front end high enough to clear anyone ahead of you.
- ✓ Before you use a ladder, inspect all rungs, fittings, braces, cleats, and rails for possible defects. Place a "DANGER" tag on all defective ladders and report them to your supervisor.
- ✓ Select the correct ladder for the job. Never use a ladder too short or too narrow for the job. Correct pitch of the horizontal distance from the top support to the foot of the ladder is1/4 the length of the ladder.
- ✓ Ladder's feet must rest on a solid foundation and be secured against slipping. Lash or tie- off the ladder securely at the top, having someone to hold the ladder while lashing or fastening.
- ✓ Always face the ladder, using both hands when climbing or descending. Use a hand line rope or material hoist to raise and lower tools and materials.
- ✓ Do not use the ladder as a skyway. This can be dangerous and will weaken the ladder structurally.
- ✓ Be sure that your shoes/boots are free of mud and grease, or any other substances that could cause a slip or fall.
- ✓ Never work higher than the third rung from the top of a straight ladder.
- ✓ Do not use metal ladders near electrical equipment or lines.
- ✓ Always use a safety belt while working from a ladder.
- ✓ "Job Built" ladder must meet all applicable standards.
- ✓ The side rail for the ladder must extend one (1) meter above any platform or landing place.

8.8 ELECTRIC INSTALLATION & EQUIPMENTS:

1- *PERSONNEL:*
   a- All electric work including checking and maintenance is to be carried out by qualified and experienced electricians. Under no circumstances any installations, modification or checking shall be carried out by other personnel.

2- *SUPPLY:*
   a- All temporary power supply used for equipment, tools, and lighting, shall not exceed the 125V rating.
   b- All temporary supply not part of the permanent installations shall be protected by Ground Fault Circuit Interrupters (GFCIs).
   c- Prior approval must be obtained from the Client before connecting any temporary supply to any existing installations.
   d- All temporary electrical supplies & facilities (such as site offices, fabrication shop, etc.) must be inspected and approved by the Client prior to energizing.

3- *ELECTRICAL TOOLS AND LIGHTING:*
   a- All electrical tools, extension lights, fittings & cables shall be inspected prior to their use to ensure that they are free from damage or defects and are in good working order. Any defective or suspect items shall be quarantined and removed from service.

4- *OPERATION GENERAL:*
   a- When Personnel are working on or near electric equipment or installations, ensure that this is isolated from energy supply. Electrical systems, switches, circuit breakers etc. are to be removed and/or locked in a safe position, or the supply source is to be disconnected.

5- *LIVE WORKING:*
   a- Prior to starting any work or any live installation, the work area shall be surveyed and all potential hazards identified.
   b- Work permit must be obtained from the appropriate agency.
   c- Electricians must never work alone on live equipment. There must always be another electrician on standby and a nearby supervisor who knows how to isolate the equipment.
   d- Representatives from the Client must be present when work is being performed on live electrical equipment.
   e- A job specific safety procedure will be prepared and approved by the Client for all interface work activities involving existing facilities.
   f- Working platforms and equipment near energized equipment shall be properly grounded.

8.9 SCAFFOLDING

1- GENERAL:

All scaffold structures shall be erected with metal components approved per ANSI requirements or equivalent. Scaffolds shall be stored to prevent damage and to permit easy access for use. Scaffold erection plans (drawing) shall be submitted to the client's Environmental Health & Safety (EHS) Safety Department for review prior to men being allowed to work on the scaffold.

2- BRACKET SCAFFOLDING:

a- Bracket and straps
b- Brackets and bracket straps shall be constructed and erected in accordance with the manufacture's instruction.
c- Bracket scaffolds shall be used only to support a light – duty loading of 120 kg/sq.m. (1.2 k.N/sq.m) (25pounds/sq. ft.).
d- Brackets, bracket straps and other associated structural member shall be free from detrimental corrosion, damage or defects.
e- Bracket strap welded to tank wall shall be at least 250mm (10inches) wide x 75 mm (3 inches) high x 10mm (0.4 inches) thick, with bends at center foe inserting brackets. The gap created by the bent section of the bracket strap must be compatible in size with the bracket to be inserted with 3mm (1/8-inch) maximum clearance on the front and back faces.
f- Bracket strap shall be welded to the tank shell for a length of at least 150 mm (6 inches) along the top edge of the strap (two 75 mm welds min.) and down 25 mm (1- inch) along each side of the strap with 5mm (3/16 inches) fillet weld. No weld is required along the bottom edge of the bracket straps.
g- If 38mm (1-1/2 inches) thick wood planks are used, the maximum circumferential distance between brackets shall not be more than 1.5 meters (5 feet) on center. Except as noted in the following paragraph, if 50mm (2 inches) thick wood planks are used the maximum circumferential distance between brackets shall not be more than 2.4 meter (8 feet) on center.
h- Only if the brackets (frames), platform units (planks), etc. are certified to meet all the requirements in OSHA 1926.450 Appendix A, Section 2(z), "Tank Builder's Scaffold" the maximum circumferential distance between brackets may be 3.2 meters (10'-6') on center. In this case, planks shall be full-dimensioned 50 mm (2-inches) thick by 300 mm (12-inches) wide Douglas fir or Southern Yellow Pine of Select Structural Grade or Scaffold Grade.
i- Brackets shall be installed vertically.
j- Only certified welders certified according to the relevant codes shall weld the brackets strap to the tank wall.
k- Prior to welding on any tank, approval of welding procedures and verification of tank integrity is required by the Proponent's Engineering unit.
l- Prior to attaching the bracket, completed bracket strap welds shall be inspected and approved by welding inspector.
m- Brackets shall be inspected prior to installation by scaffold craftsman and prior to each use by scaffold users. Damaged or defective brackets shall be removed from service.

3- GUARDRAIL AND PLATFORMS FOR BRACKET SCAFFOLDS:
   a- A continuous guardrails system shall be used along the outside platform edge.
   b- Guardrails for bracket scaffolds shall be constructed using either wire or steel tubing.
   c- Guardrails support uprights shall be made of scaffold grade tubing or structural angles.
   d- Guardrails and support uprights that are certified to meet OSHA 1925.450. Appendix A. Section 1(b) may be used for bracket scaffolds.
   e- In addition to wearing hardhats, each person shall be provided with additional protection from falling objects through one or more of the following means:

      - ✓ *Barricading the area below.*
      - ✓ *Installing toe boards with or without screen.*
      - ✓ *Erection of debris net.*

   f- Planks shall overlap in one direction.
   g- Platform units shall be secured to the brackets.
   h- The area below the bracket scaffolds shall be barricaded and warning signs posted.

8.10 CRANES& RIGGING EQUIPMENT:

1- General:
   a- A valid government heavy equipment license is required by all crane operators.
   b- A competent person shall supervise all lifts.
   c- Do not allow anyone to ride loads, slings, hooks etc.
   d- Never stand or work on or near the superstructure while a crane is moving or swinging.

2- Cranes and Lifting:
   a- All cranes shall be issued with a Safety Inspection sticker if acceptable. Prior to lifts being carried out, a lift plan must be proposed by a competent person.
   b- Before beginning any lifting operation, a method statement shall be prepared and presented for approval. Only approved methods of rigging shall be performed.
   c- Before beginning any operation, the supervisor and operator shall complete a pre-operation checklist.
   d- Hand signals shall be clarified and agreed upon between the supervisor and crane operator.
   e- When wind velocities are above 32 km/hr, the rated load boom lengths shall be reduced according to the manufacturer's specifications.
   f- The crane boom load or load line may not come closer than 6 meters to an overhead power line (voltage up to 250 kVolts), or 7.5meter where voltage is greater than 250 kVolts.
   g- Tag lines shall be used to control the movement of any suspended loads.

3- Lifting Gear:
   a- All slings (wire, synthetic) and chains shall have the safe working load (SWL) and serial number clearly marked on them.
   b- All lifting gear shall have a valid test certificate indicating that a proof load test has been carried out.
   c- An inspection register shall be maintained for all slings.

d- Damaged slings shall be removed from service and destroyed.
e- Hooks should have a safety catch, or have a fastener so that the load cannot be displaced.

8.11 MECHANICAL EQUIPMENT:

1- PERSONNEL:
   a- Only trained operators and /or qualified personnel shall be allowed to operate any mechanical equipment. Operators must hold valid certification for specific equipment that they will operate.

2- EQUIPMENT:
   a- All Vehicles shall have valid stickers properly fixed to their windshield.
   b- All cranes shall have their valid inspection sticker displayed.
   c- All mechanical equipment shall be inspected prior to use, and any defects repaired.
   d- A regular preventive maintenance program shall be established for all equipment and shall be strictly followed and documented.
   e- All moving parts of any equipment shall be securely guarded to prevent unauthorized access. Any guards removed for maintenance shall be replaced before the equipment is returned to service.

3- OPERATIONS:
   a- At the start of each shift the operator must check the levels of water, lubricants and hydraulic fluids and ensure the correct operation of all gages, and ensure all guards, and safety equipment are correctly in place.
   b- When vehicles are left unattended, engines must be stopped, parking brakes applied and all hydraulically operated booms, blades, etc. lowered to the rest position. The key shall be removed or the vehicle otherwise demobilized to prevent use of unauthorized personnel.
   c- Unless instructed otherwise, the operator shall dismount from vehicle only when the vehicle is turned off or when repair work is being carried out.
   d- Where the operator is unable to clearly see all around his machine, an attendant must be in position to direct and assist the operator.
   e- Machinery must only be used for its intended purpose, and with manufacturer operating guidelines and limits.
   f- Passengers are not to be carried.

8.12 TRANSPORTATION:

   a- No persons are permitted to drive a vehicle without a valid Government Driving license.
   b- The driver shall be familiar with all Traffic Regulations.
   c- Each driver is responsible for insuring that his vehicle is in a proper condition to make the necessary trip.
   d- Check vehicle daily and have faults rectified promptly.
   e- All drivers are properly trained and do not allow unauthorized people to drive.
   f- Keep keys secure when vehicles are not in use.
   g- Properly supervise vehicle motion particularly when reversing and near blind corners using recognized signals.
   h- Keep roadway properly maintained and adequately lit.

i- Separate vehicles and pedestrians wherever practicable. Make safe crossing places for pedestrians and warn drivers if they are near footpaths.
j- Check that loads are stable and secure.
k- All the drivers and the passengers in the company shall use seat belts.
l- Do not drive for more than ten consecutive hours.
m- The dispatch area supervisor who is authorized to sign a gate pass is responsible for checking the safety of loading the vehicle and putting the warning sign if necessary.
n- Passengers shall not be transported in the rear of pickups or on truck beds.
o- The driver must not exceed the posted speed limit.
p- All vehicles shall be parked correctly and/or in designated parking areas.
q- It is the responsibility of the driver to bring the vehicle in for scheduled maintenance.
r- A driver shall not leave the scene of the accident or move his vehicle after an accident unless he needs to take an injured person to a hospital.
s- In the event of a serious injury, fire or hazardous road block by an accident, the emergency telephone public number and emergency contact numbers for the site should be used.
t- In the case of loading long beams the speed of the vehicle should not exceed 40km/h and it must be followed by a car with warning signal lights. The transport shall be in appropriate times in which no cars are on the road or traffic is minimal.
u- When transporting heavy loads, the speed of the vehicle shall not exceed 20km/hr and must be guided with a front lead car and followed up by a rear car with warning signals lights operational during the entire trip.

8.13 PLANT OPERATIONS:

1- GENERAL:
a- Work inside all Restricted Areas will be performed based on daily work permits only. The areas shall be roped off and access permitted only to personnel working at that work permit site. Movement of personnel from one area to another shall be discouraged, unless strictly necessary or in case of an emergency.
b- Whenever work is performed in an area of the plant that is operating, the work activities shall be closely co-ordinated with the operating organization. Care will be exercised to avoid dust and noise that could interfere with the operation of the existing facilities and/or personnel.
c- No plant operation, as open/close a valve or open/shut an electrical switch, is to be executed without the prior approval of the client and then only under the direct supervision of the Supervising Operator or Plant Foreman.
d- All operatives working in work permit areas shall be instructed about the work permit requirements at the start of the workday.
e- When and if necessary, physical barriers and enclosures with fire retardant sheets shall be installed before the execution of hot works in order to avoid potential fire hazards.
f- Close co-operation with the plant's fire protection organization shall be exercised.
g- It is forbidden for personnel to access areas not included in their work area; it is also strictly forbidden to operate valves, electrical switches etc. in such areas without authorization.

8.14 INJURY AND DAMAGE REPORTING

1- GENERAL:
   a- The safety committee shall review all accidents, including near misses and first aid cases. The analysis shall lead to the definition of the accident causes and the actions taken to prevent recurrence.
   b- Note: Our objective of "Zero Lost Time Injury" (LTI) shall mean that all participants in the construction are committed to having LTI; consequently it is of the uppermost importance that the safety committee and senior site management adopt appropriate measures to prevent recurrence.

2- REPORTING:
   a- As a minimum, the accident reporting guidelines set will be used for reporting on all incidents.
   b- An immediate oral report shall be made to the operations work permit issuer. The client's (HSE) or (EHS) manager and Client representative shall be reported to every accident case involving: fatality, injuries, damage to Client equipment or property, damage and accidents involving cranes and heavy equipment, motor vehicles and fire.
   c- A preliminary report shall be submitted within 24 hours to the client's representative.
   d- For major injuries and major damage to property a written report shall be promptly submitted to client's manager/site manager and Client's representative. Subsequently, an investigation shall be performed by the Client.
   e- A follow-up detailed accident investigation report shall be submitted to the Client representative not later than 3 days after incident involving:.
      - ✓ Motor vehicle accident.
      - ✓ Damage and near misses involving cranes and heavy equipment.
   f- A job site safety list shall be realized summarizing all the records of:
      - ✓ Work injuries.
      - ✓ Fires .
      - ✓ Motor vehicles collisions.
      - ✓ Incidents involving damage to Client equipment and properties.
      - ✓ Damage and all accidents involving cranes and heavy equipment.
      - ✓ A job site safety logbook shall be maintained for recording and registering safety items that need correction or to comment on good safety practices.

8.15 FIRE PREVENTION.

1- GENERAL:
   a- Adequate firefighting equipment shall be provided.
   b- Ensure that the layout of equipment and facilities allows for ease of access.
   c- Fire extinguishers must be easily accessible and clearly marked.
   d- Flammable and explosive materials shall be kept clear of high risk operations such as welding.
   e- Electrical equipment shall be checked regularly for defects.
   f- Smoking is only permitted in clearly designated areas.
   g- Flammable liquids shall be stored in securely closed metal containers, and stored in well ventilated and sign posted areas.

h- Combustible materials shall be cleared up from site daily.
i- Waste bins are to be removed regularly.

2- FIRE PLAN:
a- Submit site layout plan showing all site offices, storage areas, yards and trash collection areas. The work site and storage yards shall be cleaned continuously and debris will be removed and dumped in designated dump areas. All trash will be removed from the job site daily and will not be allowed to accumulate.
b- Site layout to show type of fire equipment to be used and their placement.
c- Job site personnel are to be trained for the use of fire extinguishers, and fire drills should be conducted quarterly or sooner as local conditions dictate.
d- Means of communication to be provided for emergency use, i.e. telephones, remote battery operated telephones.
e- If communications are not available during initial startup, survey local area for use of pay phones and/ or use of other local business telephones.
f- Locate local police station, hospital, and fire station and post directions for sending a messenger in case of emergencies.
g- Develop emergency reporting plans taking into consideration day, night and weekend operations.

3- CONTRACTOR MATERIALS STORE YARDS:
a- Storage yards shall be laid out according to spacing of rows, fire lanes and compatibility of materials.

4- Yard maintenance and operations:
a- The store yard shall be kept free from the accumulation of unnecessary combustible material such as empty cartons or other packing or packaging materials.
b- All electrical equipment and installations must comply with the U.S National Electric Code.
c- Employees' smoking areas shall be clearly designated and no smoking strictly enforced outside these "safe" areas.
d- Motor vehicles shall be garaged and/ or repaired outside the material storage yard area. Fuel handling shall comply with NFPA 30, Flammable and Combustible Liquids Code, at a safe distance from the storage yard.

8.16 FIRST AID FACILITIES:

1- FIRST AID:
a- First aid is a help given to the injured person until medical treatment is available. First aid given to an injured employee does not stand in lieu of medical aid. Any injury that requires medical attention will be referred to a doctor. Many injuries do not require medical attention, but all injuries become severe problems if they become infected, or otherwise, not given the proper care. As scheduling permits, all shop supervisors will be trained by the safety engineer or Red Crescent to administer first aid knowledge and keep these first aid rules in mind.

2- FIRST AID RULES:
   a- First aid supplies shall be kept readily available in the cabinet.
   b- The cabinet shall be placed under the charge of the first aid attendant, who shall ensure that the cabinet is well stocked at all times.
   c- A suitable type of stretcher must be available on site.
   d- The site managers will arrange with the client the best way for medical evacuation.
   e- The site managers will provide the main office with injury summary weekly.

3- FIRST AID CABINET:
   a- A first aid cabinet containing bandages and basic medical items shall be kept under the control of the Safety Officer.
   b- This shall only be used for minor items, e.g., headache tablets, eye drops.
   c- The usage of any item from the first aid kid shall be recorded in the First Aid Register.

4- FIRST AID CENTER:
   a- The main contractor's medical Aid facility is to be used when required.
   b- All personnel are to be referred to and taken over by the Safety Officer.
   c- These cases are also to be entered into the first aid register.

8.17 DUST CONTROL

1- GENERAL:
   a- Dust shall generally be controlled by water spraying. Roads and working areas shall generally be sprayed on a daily basis.
   b- Additional water spraying may be applied to particularly dusty operations, e.g. soil blending and excavating.
   c- Local barriers, e.g. tarpaulin sheeting, will be placed with sufficient height, around blasting operations to contain dust.
   d- Vehicles speed on open (unpaved) areas shall be as slow as possible to minimize dust production and blowing.
   e- Doors, windows and openings of portable offices will be kept closed or sealed to minimize, if not totally prevent, dust accumulation at indoor areas.
   f- During sand storm conditions, sand storm (mono) goggles will be provided to and worn by site employees when working outdoors.
   g- Location of sandblasting operations shall be as remote as possible from other work areas/activities or occupancy. Temporary shelter for sandblasting crew shall be located upwind of the prevailing wind.

2- PERSONAL PROTECTION EQUIPMENT
   a- Workers shall be provided and required to wear dust masks when dusty conditions are experienced during hand digging and other duty operations.

8.18 JOB SITE INSPECTIONS:

1- BASICS:
   a- The processes involved in construction are extremely hazardous at all the stages. Accordingly, great care must be taken inside the job.

b- Plant operators and laborers must be aware of their responsibilities and of the hazards that exist in the construction involved. They also must be made safety conscious and wear the protective clothing supplied, and be aware of the step to be taken in the event of an emergency.
c- Technical training of labors and supervisors under the technical manager is essential and such personnel should be extremely safety conscious and exercise strict control on the manpower.
d- All bundling and tanks and vessels involved with hazardous chemicals must be checked for all surfaces free of cracks or any leakage.
e- Use safer and automatic processes when handling of chemical through pipes, pumps and directional valves.
f- Get the supplier's hazard data sheet.
g- Choose protective equipment and clothing.
h- Arrange for any medical checks or health surveillance needed.
i- Every employee involved with any hazardous materials and equipment, must have a copy of their data sheets.
j- Display a warning placard, especially if the data sheet is complicated or difficult to understand.
k- Check container labels and consignment notes to make sure that goods supplied are as ordered.
l- Check that handling and storage arrangements are in accordance with the suppliers warning labels and instructions.
m- Make sure that first aid and firefighting equipment is readily available at the point of use.
n- Display hazard warning signs at the entrance to your premises or at the store.
o- The employee health can be affected by the work place environment and personal health practices: eat well, drink plenty of water, exercise regularly and get enough sleep because health employees are more energetic.
p- Because of the toxicity of the chemicals founds in soot, ash and other products of combustion it is mandatory that all employees maintain their protective clothing in a clean, containment free, condition. Workers shall clean their protective clothing any time it has been contaminated by products of combustion.
q- Soiled PPE shall not be used.
r- All PPE shall be inspected routinely by the user after each use and shall have an advanced inspection annually or whenever routine inspections indicate that a problem exits.
s- The chlorine bleach shall not be used.
t- Before a person may be authorized to operate a crane he must complete a crane safety training course (NEVER ALLOW TO OVERLOAD A CRANE) never lift a load over anyone's head & don't stand beneath a loaded boom.
u- This list is not exhaustive rather indicative of the safety awareness culture that the jobsite safety and construction managers must convey and implement in all of their assignments.

8.19 GENERAL SAFETY RULES:

1- Report any unsafe machinery conditions or acts immediately to management.
2- Good housekeeping must be maintained at all times.
3- Fire extinguishers must not be tampered with. These are for use only at emergencies.
4- No horse play or practical jokes are allowed on site.

5- Overalls, safety boots and any other protective equipment must be worn at all times and be kept in good condition.
6- Damage to equipment, building etc. must be reported immediately.
7- Heavy items should not be lifted without assistance and approval of the lifting method.
8- Accidents must be avoided, but any injury must be reported immediately.
9- Attitude and action of every employee goes hand in hand with safety.

8.20 EMERGENCY EVACUATION PROCEDURE

1- SECURITY:
All the construction areas are inside the security fenced area of a construction project and an operating plant. All the construction materials and small components and fittings shall be stored in a secured warehouse or in fenced lay down areas. In general, no material included in the scope of work for construction shall be stored in unfenced and unguarded areas. Although there is a manned security gate, there are security/gate pass requirements for access to the site.

2- EMERGENCY PROCEDURES:
In an emergency or when a "Stop Work" alarm is sounded, each supervisor shall ensure that:
   a- All work is stopped immediately.
   b- All equipment is shut down.
   c- All men are evacuated to a pre-determined assembly point.
   d- A roll call is taken and each man is accounted for.
   e- No one is permitted to work until notification has been received that it is safe to do so.

3- HELP IN EMERGENCY:
In the event of an emergency situation (serious personal injury, fire, critical damage to operating equipment, etc) help may be obtained by contacting the nearest ENCOCORP management, safety or otherwise.
Emergency transmitting message will be by telephone or messenger. The employee will identify himself by giving:
   a- Name;
   b- Badge Number;
   c- Exact Location;
   d- Nature of Emergency;
   e- Seriousness of Emergency; and
   f- Do not hung up until told to do so.

4- EMERGENCY CONTACT DETAILS:
ENCOCORP Office (Tel: ---------- Fax: ----------)
Safety Officer
Security
Site Manager ( )

8.21 HAZARDOUS MATERIAL & WASTE MANAGEMENT:

1- PLANT & SITE HAZARD IDENTFICATION:
   a- The plant and site manager is to conduct a Job-Site Hazard Identification Procedure using the following classifications:
   b- Hazards classified as Class A, B or C are used to describe the potential severity in the event of an accident.
      - ✓ ***Class "A" Hazards:***
        A condition or practice likely to cause permanent disability, loss of life or body part, and/ or extensive loss of structure, equipment or material.
      - ✓ ***Class "B" Hazards:***
        A condition practice likely to cause serious injury or illness (resulting in temporary disability) or property damage that is disruptive, but less severe than class "A".
      - ✓ ***Class "C" Hazards:***
        A condition or practice likely to cause minor (non-disabling) injury or illness or non- disruptive property damage.

   c- Cross hatch site map showing hazard areas in color.
      - ✓ Red for ***"A"*** Hazards
      - ✓ Yellow for ***"B"*** Hazards
      - ✓ Green for ***"C"*** Hazards

   d- Record Potential Hazard Areas:
      - ✓ Potential Hazards to ENCOCORP Site employees.
      - ✓ Potential Hazards to ENCOCORP Site.
      - ✓ Incompatible materials or processes.
      - ✓ Hazardous materials identification.
      - ✓ Potential hazards to the general public.
   e- List the Hazards identified.
   f- List corrective action for every hazard identified

2- WATER:
   a- Waste water shall be disposed of in a controlled and acceptable manner, without polluting underground water sources.

3- SOLID WASTE:
   a- All waste / scrap shall be kept under control and in demarcated areas prior to removal from site.
   b- Different types of solid scrap e.g. wood, metal shall be kept in separate bins/ areas.
   c- Waste shall be stored such that it does not constitute a fire, health or safety hazard.
   d- All food waste shall be stored in closed containers.

8.22 SECURITY PROCEDURES:

1- SECURITY:
Although there is a manned security gate, there are security/gate pass requirements for access to the site.

2- EMERGENCY PROCEDURE:
In an emergency or when a "Stop Work" alarm is sounded, each supervisor shall ensure that:

a- All work is stopped immediately.
b- All equipment is shut down.
c- All men are evacuated to a pre-determined assembly point.
d- A roll call is taken and each man is accounted for.
e- No one is permitted to work until notification has been received that it is safe to do so.

3- EMERGENCY CONTACT DETAILS:
ENCOCORP Office (Tel: --------- / Fax :----------)
HSE Officer
Security
Site Manager

8.23 DEMOBILIZATION PLAN

1- GENERAL:

a- Demobilization:
- ✓ Demobilization gradually follow when the construction activities are nearly completed. The detailed demobilization plan shall be prepared by the construction superintendent based on the approved construction schedule. However, safety measures shall always be considered and implemented during the demobilization process.

b- Manpower & Equipment:
- ✓ Personnel involved or worked in the jobsite shall surrender all tools and equipment issued to them during the demobilization period. Likewise, each employee shall make the necessary clearances from site store and equipment in-charge signed by the foreman, supervisor and approved by construction site Manager.

c- Housekeeping:
- ✓ ENCOCORP shall remove all debris and clean the construction area designated in the construction scope of work. All construction scrap, materials & debris shall be removed & cleaned from the work areas inside the plant.

d- Temporary Site Office Building Facilities:
- ✓ ENCOCORP shall demobilize / dismantle or remove the temporary site office building and facilities upon completion of the project.
- ✓ ENCOCORP shall ensure that, all equipment, materials, and debris are removed from the work area.
- ✓ It is also ENCOCORP's duty to restore the site to its original condition to the satisfaction of the Client or its representative.

e- Disposal of Construction Debris:
- ✓ ENCOCORP shall remove all excess excavated materials and construction debris from the construction right-of-way. The designated disposal location must be approved by the Client.

f- Disposal of Hazardous Materials:
- ✓ There will be only limited or minimum amount of Physical Hazardous materials to be disposed in this project, however, any of the identified substances like paints, solvents, or other items which are considered to be hazardous shall be disposed in accordance with Clients requirements.

8.24 ABRASIVE BLASTING & PAINTING:

1- PERSONNEL:
- a- All personnel involved with using paints, solvents and blasting equipment shall be in good health, and undergo medical examinations at least every two years.
- b- All personnel shall be trained in the correct use of painting and blasting equipment, and shall be aware of health hazards associated with paints, solvents and abrasives.

2- EQUIPMENT:

Blasting nozzles shall be fitted with dead man switch and grounded to prevent accumulation of static electricity.

3- MATERIAL:
- a- Some solvents and Paint pigments are toxic and ingestion, inhalation and skin absorption must be avoided by using adequate protection.
- b- Some solvents, cleaning materials and abrasives are irritants and can cause skin problems such as dermatitis. Skin contact with these materials should be avoided by using adequate protection.
- c- Silica sand shall not be used as abrasive.

4- OPERATION:
- a- Areas where blasting is going on shall be roped off or barricaded, and signs posted reading "NO ENTRY- GRIT BLASTING IN PROGRESS".
- b- Paints and solvents shall be mixed in a well ventilated area.
- c- Only sufficient material for daily requirement shall be stored in the working area. All surplus material shall be stored in designated storage areas.

5- PERSONNEL PROTECTIVE EQUIPMENT:
- a- Safety shoes, overalls and helmets are to be worn by all personnel at all times.
- b- Additionally:
  - ✓ Blasting operators are to wear a ventilated hood, and heavy duty gloves.
  - ✓ Attendance and other nearby personnel are to wear a face mask and goggles.
  - ✓ Operators involved in cleaning with acids or solvents are to wear face shields and rubber gloves.
  - ✓ Paint sprayers are to wear face mask, face shields and gloves.
  - ✓ Respirators are required when working in confined spaces.

8.25 LOCK OUT AND TAG SYSTEM:

1- GENERAL:
   a- Prior to commencing work on or near any energized system (electrical, hydraulic, mechanical, other) the equipment shall be isolated from the energy source.
   b- Isolation of fluid systems can be accomplished by installation of blinds, closing of valves, removal of fluid, and removal of piping.
   c- Isolation of electrical system can be accomplished using switches, breakers, locks, tags and other approved isolating devices..
   d- Isolation of mechanical systems can be accomplished by a physical lock or a guard.
   e- In all cases residual energy shall be removed from the system.

2- WORK PERMIT:
   a- The activity work permit shall identify the lockout and tagging system to be used. Work Permit Issuers and Work Permit Receivers shall ensure that lockout and tag are in place, and their use shall be strictly enforced.

3- LOCKS& TAGS:
   a- All operators shall be issued with a sufficient number of locks, each having one unique key only. The issue of all locks and keys shall be recorded.
   b- The craftsman shall use his lock to secure chains, clips, or other immobilizing device.
   c- Where more than one craftsman is working on the system, each craftsman shall fix his own lock and not rely on any locks placed by others.
   d- A tag shall be attached to each lock indicating the name of the person placing the lock, and the reason.
   e- At each shift change, the oncoming craftsman shall verify that all locks are in place, and shall endorse the previously placed tag.
   f- When job tasks are complete, the craftsman shall remove his lock and tag.

8.26 ADVERSE WEATHER CONDITION:

1- PURPOSE:
   a- ENCOCORP considers the hazard caused by bad weather condition as critical. The purpose of this procedure is to protect personnel from injury while working on site and to avoid incident especially when driving vehicles or equipment.

2- DRIVING VEHICLE OR EQUIPMENT:
   a- Fasten seatbelt and drive defensively.
   b- Drive at low speed.
   c- Maintain a safe distance and allow more than the normal following distance between you and the vehicle ahead.
   d- Turn on your low beam headlights. Do not switch your high beam lights.
   e- Pull off the road and park in a safe place when the rain, fog or sand storm is so dense that you cannot see the vehicle in front of you.
   f- On wet road, avoid sudden stop, breaking abruptly can lock your wheels and your car will skid.
   g- Turn on your hazard lights when driving in fog.

3- WORKING ON SITE:
   a- No crane lifting shall be made when the visibility is poor or when the wind is at the maximum permissible velocity of 32 KPH (20 MPH)
   b- When the weather conditions change and reach to a hazardous situation, ENCOCORP Superintendent, Supervisors or HSE Officer will stop the work.
   c- Personnel working in the desert will be supplied with proper eye and breathing protection during rain and sandstorms.

8.27 HYDROSTATIC TESTING

1- GENERAL:
   a- A competent supervisor shall be in charge of all pressure tests.
   b- All pressure tests shall be done in the presence of the site safety representative.
   c- Vents shall be installed at high points to vent air/gas from the vessel whilst filling, and also to prevent damage to the vessel during draining of water.
   d- The whole area must be barricaded and warnings signing "HYDRO TESTING IN PROGRESS, KEEP AWAY" must be displayed.
   e- Only involved personnel must be in the area.
   f- Pressure gauges and manifolds must be calibrated and in good condition.

8.28 DEMOBILISATION PLAN

1- GENERAL:
   a- Project mobilization and demobilization shall generally take place in accordance with the project Execution plan submitted separately.
   b- No key staff will be demobilized without the prior written approval of the client.

8.29 HOUSEKEEPING

1- A regular housekeeping shall be established on all sites, to maintain the cleanliness and tidiness of the area. Poor housekeeping can lead to hazard/injury if rubbish waste materials are accumulated and equipment are scattered on site.

2- To effectively prevent fires, good housekeeping will be maintained on the site. Collection and disposal of combustible refuse will be performed regularly

3- This procedure applies to all ENCOCORP construction sites and restricted areas including Workshops, material storage areas and Fabrication yards.
   a- All personnel should be informed of this procedure.
   b- Trash, debris, metal waste shall be removed at regular intervals and always preferably at the end of the working day.
   c- All employees shall clean their respective work areas daily before quitting time.
   d- Covered containers, drums, plastic bags shall be provided at various working areas and shall be clearly marked.
   e- Contents of ash trays should not be mixed with other waste.
   f- Oily rag, wood shaving and other highly combustible waste materials should be placed in metal bins with close-fitting lids.
   g- Non-combustible absorbents shall be used to remove spill or leak of oil.
   h- Flammable liquids shall be placed away from the heat source.
   i- Idle equipment shall be parked away from work locations.

j- Mechanized repair equipment shall be positioned upwind away from operational area.
k- All equipment and machinery shall be grouped/parked at a safe location after working hours.

8.30 CONFINED SPACE MANUAL

Introduction

This document has been developed to ensure the safety of personnel required to enter and conduct work in confined spaces. The program contained herein describes reasonable and necessary policies and procedures for any and all facilities, departments, and individuals who are associated with confined space entry operations. This program shall apply to all confined space entry operations. As it is the policy of ENCOCORP to provide its employees with the safest work environment possible, the company requires compliance with the procedures set forth in this manual. A site-specific program may be used, provided it meets or exceeds the requirements set forth in this policy.

1- IDENTIFYING CONFINED SPACES:

Recognition is an important aspect of making a safe entry into a confined space. Not all confined spaces will be considered permit-required confined spaces and being able to identify the difference between the two is important. To clarify what constitutes a Confined Space, the following definition will be used.
A Confined Space is any space that has the following characteristics:

a- It is large enough or so configured that an employee can bodily enter and perform assigned work.

b- It has limited or restricted means for entry or exit.
Confined-space openings are limited primarily by size and location. Openings may be small in size and may be difficult to move through easily. However, in some cases openings may be very large; for example, open-topped spaces such as pits or excavations. Entrance and exit may be required from top to bottom, or side. In some cases, having to access the work area by a fixed ladder may constitute limited or restricted entry or exit. Size or location will generally make rescue efforts difficult.

c- It is not designed for continuous employee occupancy.
Most confined spaces are not designed for employees to enter and work on a routine basis. They may be designed to store a product, enclose materials and processes, or transport products or substances. Because they are not designed for continuous occupancy, frequently they will not have good ventilation or lighting. Therefore, occasional employee entry for inspection maintenance, repair, cleanup, or similar tasks, can be difficult and dangerous. The danger associated with entry may come from chemical or physical hazards within the space.

d- A Non-Permit Required Confined Space.
A Non-Permit Confined Space is a confined space that does not contain, nor has the potential to contain, any hazard capable of causing death or serious physical harm. Examples of non-permit required confined spaces might include the interiors of HVAC units, certain air plenums and pipe chases, attics, walk-in freezers or refrigerators, and some building crawl spaces.

e- A Permit-Required Confined Space:
Is a confined space that is potentially hazardous?
A permit-required confined space has one or more of the following characteristics:

- ✓ Contains or has a potential to contain a hazardous atmosphere.
- ✓ Contains a material that has the potential for engulfing an entrant.
- ✓ Has an internal configuration such that an entrant could be trapped or asphyxiated inwardly-converging walls or by a floor that slopes downward and tapers to a smaller cross-section; or
- ✓ Contains any other recognized serious safety or health hazard. Examples of serious safety or health hazards might include:
  1. Fall hazards.
  2. Unguarded machinery.
  3. Extreme heat or cold.
  4. Steam pipes or chemical lines.
  5. Hazardous noise levels.
  6. Electrical hazards.
  7. Presence of asbestos.
     Potentially hazardous levels of dust (such as what might occur at the Feed Mill).

f- Because of the lack of ventilation in most confined spaces, they will have the potential for a hazardous atmosphere. Therefore, they must be designated "permit-required," and the procedures for making entry into a permit-required space must be followed. Examples of permit-required confined spaces include sewers, electrical vaults, steam tunnels, sump pits, certain mechanical rooms, some excavations, and other types of enclosures.

g- Supervisors are directly responsible for ensuring the safety of their employees in regards to confined spaces. It is their responsibility to evaluate potentially hazardous spaces within their facilities and areas to ensure that the proper precautions are taken for safety. This includes clearly marking permit-required confined spaces, training employees, and ensuring proper entry procedures are followed. These responsibilities may be delegated to another competent person provided he/she is qualified.

h- Physical Plant supervisors are responsible for ensuring their employees are properly trained to do the jobs they are sent to do. This includes recognition of confined spaces and proper procedures for making entry into permit-required confined spaces whenever necessary. No Physical Plant employee shall be sent on a job that potentially involves work in a confined space unless they have been properly trained in confined space entry and work procedures.

I- It may be determined that a confined space presents no real danger for employees. However, it is recommended that all spaces be considered potentially dangerous until they have been evaluated and tested. Once a space has been evaluated, the Environmental Health and Safety Department, or Client HSE Manager, shall determine if the confined space requires a permit and will apply appropriate labeling.

2- IDENTIFYING CONFINED SPACE HAZARDS:

a- Once a space has been identified as confined, the hazards that may be present within the confined space must be identified. Confined-space hazards can be grouped into the following categories:
- ✓ **Oxygen-deficient atmospheres.**
- ✓ **Flammable atmospheres.**
- ✓ **Toxic atmospheres.**
- ✓ **Mechanical and physical hazards**.

b- Every confined space must be evaluated for these four types of hazards. The three types of atmospheric hazards are often the most difficult to identify since they might not be detected without the assistance of a gas monitor.

✓ **Oxygen-Deficient Atmospheres**

1. The normal atmosphere is composed of approximately 21% oxygen and 79% nitrogen. An atmosphere containing less than 19.5% oxygen shall be considered oxygen-deficient.
2. The oxygen level inside a confined space may be decreased as the result of either consumption or displacement.
3. There are numbers of processes that consume oxygen in a confined space. Oxygen is consumed during combustion of flammable materials, as in welding, cutting, or brazing. A more subtle consumption of oxygen occurs during bacterial action, as in the fermentation process. Oxygen can also be consumed during chemical reactions such as in the formation of rust on the exposed surfaces of a confined space. The number of people working in a confined space and the amount of physical activity can also influence oxygen consumption. Oxygen levels can also be reduced as the result of oxygen displacement by other gases.

✓ **Flammable Atmospheres**

1. Flammable atmospheres are generally the result of flammable gases, vapors, dust mixed in certain concentrations with air, or an oxygen-enriched atmosphere.
2. Oxygen-enriched atmospheres are those atmospheres that contain an oxygen concentration greater than 22%. An oxygen- enriched atmosphere will cause flammable materials such as clothing and hair to burn violently when ignited.
3. Combustible gases or vapors can accumulate within a confined space when there is inadequate ventilation. Gases that are heavier than air will accumulate in the lower levels of a confined space. Therefore, it is especially important that atmospheric tests be conducted near the bottom of all confined spaces.
   The work being conducted in a confined space can generate a flammable atmosphere. Work such as spray painting, coating, or the use of flammable solvents for cleaning can result in the formation of an explosive atmosphere.

Welding or cutting with oxyacetylene equipment can also be the cause of an explosion in a confined space and shall not be allowed without a hot work permit. Oxygen and acetylene hoses may have small leaks in them that could generate an explosive atmosphere and, therefore, should be removed when not in use. The atmosphere shall be tested continuously while any hot work is being conducted within the confined space.

✓ **Toxic atmospheres**

May be present within a confined space as the result of one or more of the following:

1. The Product Stored in the Confined Space.
   a) When a product is stored in a confined space, the product can be absorbed by the walls and give off toxic vapors when removed or when cleaning the residual material. The product can also produce toxic vapors that will remain in the atmosphere due to poor ventilation.

2. The Work Being Conducted in the Confined Space.
   a) Toxic atmospheres can be generated as the result of work being conducted inside the confined space. Examples of such work include: Welding or brazing with metals capable of producing toxic vapors, painting, scraping, sanding,
   b) etc. Many of the solvents used for cleaning and/or degreasing produce highly toxic vapors.

3. Areas Adjacent to the Confined Space.
   a) Toxic fumes produced by processes near the confined space may enter and accumulate in the confined space. For example, if the confined space is lower than the adjacent area and the toxic fume is heavier than air, the toxic fume may "settle" into the confined space.

✓ **Mechanical and Physical Hazards:**

1. Problems such as rotating or moving mechanical parts or energy sources can create hazards within a confined space. All rotating or moving equipment such as pumps, process lines, electrical sources, etc., within a confined space must be identified.

2. Physical factors such as heat, cold, noise, vibration, and fatigue can contribute to accidents.

3. These factors must be evaluated for all confined spaces.

4. Excavations could present the possibility of engulfment. Employees shall be protected from cave-ins by sloping, benching, or shoring systems when the depth of the excavation is more than four feet. In some circumstances, air-monitoring may also be required.

3- CONFINED SPACE ENTRY PROGRAM:

The confined space entry program is identified as follows:

A. Identifying All Confined Spaces .
B. Preventing Unauthorized Entry .
C. The Permit System .
D. Planning the Entry .

E. Conducting Pre-Entry Training.
F. Preparing the Confined Space for Entry.
G. Utilizing Safety Equipment.
H. Atmospheric Testing Procedures.
I. Confined Space Cleaning Procedures.
J. Rescue Procedures.

A. Identifying All Confined Spaces .
   a- All confined spaces located within a facility or under the facility's control should be identified. Once the space has been identified as Confined, the Environmental Health and Safety Dept. – EHSD (or Client's HSE Manager) shall determine if a permit is required. All employees shall be made aware of these confined spaces through training or instruction provided by supervisors or their designated representatives. Assistance in this training shall be provided by EHSD (or Client's HSE Manager).
   b- Identified confined spaces will be tagged and marked with a Warning-Signal explaining its existence, characteristic and associated potential hazards.

B. Preventing Unauthorized Entry:
   a- All employees shall be instructed by supervisors or their designated representatives that entry into a confined space is prohibited without an authorized permit.
   b- Supervisors or their designated representatives shall instruct all employees to list their names on the authorized permit before they will be allowed to enter a confined space.

C. The Permit System:
   a- When a confined space must be entered, a permit shall be completed and authorized by department heads, supervisors, or their designated representative's prior entry to the confined space. This permit shall serve as certification that the space is safe for entry. The permit shall contain the date, the location of the space, and the signature of the person providing the certification.
   b- A permit shall not be authorized until all conditions of the permit have been met. The permit to be used by ENCOCORP personnel is the Client Work permit in Confined or Enclose Spaces, EHS Form Category V and Client Permit to Work.

D. Planning the Entry:
The first step towards conducting a safe confined-space entry is to plan the entry. This will allow for the identification of all hazards, and for the determination of all equipment necessary, to complete the project.
   a- Gathering General Data:
      ✓ Identify the confined space. Give the name or location of the confined space.
      ✓ Give the reason for entering the confined space. Be specific. Also, identify if hot work will be done.
      ✓ Identify the contents of the confined space. This refers to any chemicals or other materials and energy that are usually present in the confined space.

b- Identifying the Hazards:

NOTE: Atmospheric testing shall be conducted prior to entering permit-required confined spaces. It is mandatory that the entry supervisor conduct these tests; however, any competent person certified in confined space entry may do so.

- ✓ *The entry supervisor will determine the oxygen content and record this on the entry permit.*
- ✓ *The entry supervisor will determine flammable gas content and record this on the entry permit.*
- ✓ *The entry supervisor will determine the levels of H2S and Carbon Monoxide and record this on the entry permit.*
- ✓ *If a toxic substance is determined to be in the confined space during testing by the entry supervisor, Environmental Health & Safety (or Client HSE Manager) shall be contacted to assist in obtaining a Material Safety Data Sheet MSDS or other chemical information to determine what type of personal protective equipment is required, the potential health effects, the Permissible Exposure Limits, and any other information needed to safely conduct the work.*
- ✓ *Entry supervisors will determine mechanical and physical hazards. They shall list all items and energy that will require lockout/tag out, blanking and bleeding, disconnecting, or securing. Physical hazards should also be listed.*

c- Ventilation of the Confined Space:

- ✓ Indicate whether mechanical or natural ventilation will be used. Describe the procedures to be used.
- ✓ NOTE: If mechanical ventilation is to be used, the exhaust must be pointed away from personnel or ignition sources. Also, mechanical ventilators should be bonded to the confined space.

d- Isolating the Confined Space:

- ✓ Describe the procedures for disconnecting equipment or lockout and tag out. All mechanical, electrical, or heat-producing equipment should be disconnected or locked and tagged out. This would also include any pumps that pull fluid from, or pump fluid into, the confined space.

e- Purging/Cleaning the Confined Space:

- ✓ Indicate if the confined space will be purged. Purging with inert gas is not recommended. If the space must be purged, describe the procedures.
- ✓ Indicate the type of cleaning methods to be used. If chemical cleaners are to be used, Name the type and describe the procedures. The MSDS for the chemical should be consulted prior to use.

- ✓ NOTE 1: When introducing a chemical into a confined space, the compatibility of that chemical with the contents of the confined space must be checked. If in doubt, consult Environmental Health & Safety (or Client's HSE Manager).
- ✓ NOTE 2: If steam is to be used, the hose should be bonded to the confined space.

f- Placement of Warning Signs:
- ✓ Indicate if warning signs or barriers will be needed to prevent unauthorized entry or to protect workers from external hazards. If the confined space will be left open and unattended for any length of time, warning signs, and barriers such as barricades and/or caution tape will be required.

g- Identifying All Personnel:
- ✓ List all employees that will be required to prepare the confined space and complete the work inside the space.

h- Identifying Necessary Equipment:
- ✓ List all equipment that will be necessary to complete the project

E. Conducting Pre-Entry Training:

Once the entry has been planned, supervisors or their designated representatives must train all employees who will be involved in the entry. The training should be conducted no earlier than one day before entry is to be made.

The following outline should be used for the training:

a- Identify the confined space and the reason(s) for entry.

b- Identify the work detail:
- ✓ *Assign each employee the job(s) he/she is to perform in the entry project (entrant, standby person, etc.).*
- ✓ *If an employee is required to use a piece of equipment be sure that he/she is capable of using the equipment properly.*
- ✓ *Inform all personnel that no one is to enter the confined space unless the authorized attendant is present at the work site.*

c- Inform entrants of all known or suspected hazards:
- ✓ *Inform personnel of any access or exit problems.*
- ✓ *Inform personnel of all equipment that must be used.*
- ✓ *Inform personnel of the contents of the confined space.*
- ✓ *Inform personnel of all atmospheric levels that must be maintained before entering and while working in the confined space. If a toxic atmosphere or substance is present or could become present, the following additional training must be completed. If respiratory protection is not going to be used, inform personnel of the maximum permissible exposure level (PEL) that can exist within the confined space, and the method used to monitor PEL.*
- ✓ *Inform personnel of the potential health effects of exposure to the toxic atmosphere or substance.*
- ✓ *Inform personnel of the signs and symptoms of exposure to the toxic fume.*
- ✓ *Inform personnel of the personal protective equipment (PPE) that they will be required to wear.*
- ✓ *If entrants are unaware of the proper use of the PPE, they must be trained in the proper use of this equipment.*
- ✓ *<u>NOTE</u>: Supervisors may request assistance from Environmental Health & Safety (or CLIENT's HSE Manger) in providing the above-mentioned training.*
- ✓ *Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. A local physician shall determine what the requirements of health and physical conditions pertinent are. The respirator user's medical status should be reviewed periodically (annually).*

d- Identify Isolation Procedures:
- ✓ *Inform the personnel responsible for the lockout/tag out of all equipment that must be isolated.*
- ✓ *Inform the personnel responsible for performing this function of the methods to be used.*

e- Identify purging and/or ventilation procedures:
- ✓ *Inform all personnel responsible for performing this function of the methods to be used.*

f- Identify all equipment needed:
- ✓ *Inform personnel involved in the project of all equipment that will be necessary to complete the project.*
- ✓ *Make sure that all employees are capable of using their assigned equipment properly.*

g- Determine necessary personal protective equipment:
- ✓ *Inform personnel of all PPE that must be used to ensure their safety.*
- ✓ *Make sure that all personnel required to use PPE are trained in the proper use of the equipment.*

h- Establish communication:
- ✓ *Inform all entrants that they are required to maintain communication with the authorized attendant.*
- ✓ *Inform authorized attendant that he/she must maintain constant contact with all entrants.*
- ✓ *Inform personnel of the type of communication they are to use.*

i- Protect from external hazards:
- ✓ *Inform personnel where signs and barriers will be placed to prevent unauthorized entry and protect entrants from external hazards*.

j- Pre-plan rescue procedures:
- ✓ *The designated authorized attendant(s) should be informed of the rescue procedures to be followed.*
- ✓ *The authorized attendant should be informed that he/she can have no other duty but maintain contact with personnel inside the confined space.*
- ✓ *Inform the authorized attendant(s) that they must not enter the confined space under any circumstances.*

k- Place the confined space back into service:
- ✓ *Inform personnel of the steps to be taken to place the confined space back into service.*

F. Preparing the Confined Space for Entry:

Once the entry has been planned and personnel have been trained, the next step is to prepare the confined space for entry.

The following steps are to be followed when preparing the confined space for entry:

a- Place warning signs or barriers around the confined space to prevent unauthorized entry as necessary.

b- Place all tools, safety equipment, monitoring equipment, etc., near the confined space.

c- Isolate all mechanical and/or electrical hazards as necessary.

d- Purge/ventilate the confined space as necessary.

e- Test the atmosphere using an appropriate gas monitor:
  - ✓ *If oxygen content is less than 19.5% or greater than 21.5%, perform additional ventilation. Then shut off ventilation equipment and re-test the oxygen content.*
  - ✓ *If oxygen content is between 19.5% and 21.5%, continue entry preparation.*

f- Test for flammable gases:
  - ✓ *If the meter reading is less than 10% of the lower explosive limit (LEL), continue entry preparations.*
  - ✓ *If the meter reading is above 10% of the LEL, continue ventilation of the confined space. Then shut off the ventilation and have the atmosphere re-tested.*
  - ✓ *If the meter reading is still above 10% of the LEL, the confined space must be cleaned before entry is permitted. If the confined space must be entered for cleaning purposes, the procedures outlined in Item 9 of this section must be followed.*

g- Test for toxics (If a toxic atmosphere is present, no person should be permitted to enter the confined space at a level exceeding the Permissible Exposure Limit without proper Personal Protective Equipment. Environmental Health & Safety should be called to assist in identifying proper precautions and the protective measures to be taken.

h- Assemble all personnel involved and review rescue procedures. The entry supervisor will then add any needed information, then complete and sign the permit.

i- Notify Department Head or supervisor that entry is commencing. If Department Head or supervisor is unavailable, notify EHS Department (or Client's HSE Manager).

G. Utilizing Safety Equipment:

Where practical, all personnel entering a confined space should be equipped with a retrieval line secured at one end to the entrant by a full-body harness with its other end secured to a tripod lifting hoist.

H. Atmospheric Testing Procedures:

a- All of the manufacturer's operating instructions must be followed.

b- The test equipment should be calibrated and tested in a known atmosphere to insure its accuracy.

c- Ventilation equipment must be shut off before conducting any atmospheric tests.

d- The atmosphere must be tested at the bottom, top, and middle of all confined spaces.

e- The atmosphere must be continuously monitored while work is being conducted in the confined space.

f- If the confined space is left for any reason, the atmosphere must be re-tested before re-entering the space.

I. Confined Space Cleaning Procedures:

a- If cleaning must be conducted in a confined space to achieve acceptable atmospheric conditions, the following procedures must be followed.

b- All entrants must be equipped with designated safety equipment.

c- All entrants must be equipped with a Self-Contain Breathing Apparatus (SCBA).

d- No spark-producing tools will be allowed for use.

J. Rescue Procedures:

In the event of an emergency, the attendant should:

a- Immediately summon the Nearest Fire Department by telephone 02_____Ext. __ or Job Site First Aid at telephone 02 _____ Ext. ____

b- Attempt to remove the victim by the use of the retrieval line from outside the confined space if this can be accomplished without creating further hazard for the entrant or the attendant.

c- If the authorized attendant is able to remove the victim with the retrieval line, he/she should administer aid within the limits of his/her training until Emergency Medical Services (EMS) arrive.

d- If the attendant is unable to remove the victim by using the retrieval line, he or she must wait for help to arrive. The authorized attendant(s) is not to enter the confined space for any reason.

e- Give EMS personnel any information they request.

4- RESPONSIBILITIES & TRAINING REQUIREMENTS:

Everyone involved in a confined-space entry project has certain responsibilities and requires a certain amount of training. It is very important that every individual is familiar with his/her responsibilities. This section outlines the responsibilities and training requirements of each individual involved in a project.

A. Director of Environmental Health & Safety (or Client's HSE Manager):

a- The Director of Environmental Health & Safety CLIENT'S HSE Manager) or his/her designated representative shall be responsible for the following.

b- Ensuring compliance with standards set forth in the program by periodic inspection of entry sites and canceling permits where unsafe conditions are present.

c- Assisting Supervisors with:

- ✓ *Providing training as set forth in the program.*
- ✓ *Identification of confined spaces.*
- ✓ *Identifying spaces that require a permit for entry.*
- ✓ *Labeling Permit-Required Confined Spaces.*

d- Performing a single annual review covering all entries performed during a 12 month, period to ensure employees participating in entry operations are protected from permit space hazards.

e- The Director of Environmental Health & Safety CLIENT'S HSE Manager) or his/her designated representative shall be responsible for the following.

f- Ensuring compliance with standards set forth in the program by periodic inspection of entry sites and canceling permits where unsafe conditions are present.

g- Assisting Supervisors with:

- ✓ *Providing training as set forth in the program.*
- ✓ *Identification of confined spaces.*
- ✓ *Identifying spaces that require a permit for entry.*
- ✓ *Labeling Permit-Required Confined Spaces.*

h- Performing a single annual review covering all entries performed during a 12 month, period to ensure employees participating in entry operations are protected from permit space hazards.

B. Supervisors or Their Designated Representatives:

a- Supervisors or their designated representatives shall be responsible for the following:

- ✓ *Identifying confined spaces within facilities or areas under their control.*
- ✓ *Identifying hazards within a confined space under their control.*
- ✓ *Documenting that all training requirements for a specific confined space entry have been met by signing the pre- entry authorization space on the entry permit.*

C. Entry Supervisors

a- Entry Supervisors shall be responsible for the following:

b- Ensuring that the required atmospheric tests are performed at the confined space and results recorded on the permit prior to entry authorization.

c- Obtaining and maintaining all equipment necessary to complete the confined space entry project.

d- Authorizing entry by signing the Entry Authorization space on the entry permit after all conditions for a safe entry have been met.

e- Terminating the entry and canceling the permit when:

- ✓ *Entry operations covered by the entry permit have been completed.*
- ✓ *A condition that is not allowed under the entry permit arises in or near the permit space.*

f- Determining, whenever responsibility for a permit space entry operation is transferred, and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

D. Authorized Entrants:

a- The person(s) authorized to enter a confined space shall be responsible for and receive training in the following:

b- The knowledge of hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure.

c- Proper use of equipment, which includes:

- ✓ *Atmospheric testing and monitoring equipment.*
- ✓ *Ventilating equipment needed to obtain acceptable entry conditions.*
- ✓ *Communication equipment necessary to maintain contact with the attendant.*
- ✓ *Personal protective equipment as needed.*
- ✓ *Lighting equipment as needed.*
- ✓ *Barriers and shields as needed.*
- ✓ *Equipment, such as ladders, needed for safe ingress and egress.*
- ✓ *Rescue and emergency equipment as needed.*
- ✓ *Any other equipment necessary for safe entry into and rescue from permit spaces.*

d- Communication with the authorized attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space if required.

e- Alert the authorized attendant (standby person) whenever:
- ✓ *The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or*
- ✓ *The entrant detects a prohibited condition.*

f- Exiting the permit space as quickly as possible whenever:
- ✓ *An order to evacuate has been given by the authorized attendant or the entry supervisor;*
- ✓ *The entrant recognizes any warning sign or symptom of exposure to a dangerous situation;*
- ✓ *The entrant detects a prohibited condition; or*
- ✓ *An evacuation alarm is activated.*

E. Authorized Attendants.

a- Persons authorized to perform duties as authorized attendant shall be responsible for and receive training in the following:

b- Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of exposure.

c- Awareness of possible behavioral effects of hazard exposure in authorized entrants.

d- Continuously maintaining an accurate count of authorized entrants in the permit space and ensuring that the means used to identify authorized entrants accurately identifies who is in the permit space.
Remaining outside the permit space during entry operations until relieved by another authorized attendant.

f- Attempting non-entry rescue if proper equipment is in place and the rescue attempt will not present further hazards to the entrant or authorized attendant.

g- Communicating with authorized entrants as necessary to monitor entrant status to alert entrants of the need to evacuate the space when conditions warrant.

h- Monitoring activities inside and outside the space to determine if it is safe for entrants to remain in the space and ordering the authorized entrants to evacuate the permit space immediately under any of the following conditions:
- ✓ *If the authorized attendant detects a prohibited condition.*
- ✓ *If the authorized attendant detects the behavioral effects of hazard exposure in an authorized entrant.*
- ✓ *If the authorized attendant detects a situation outside the space that could endanger the authorized entrants.*
- ✓ *If the authorized attendant cannot effectively and safely perform all the duties required by this program.*

i- Summoning rescue and other emergency services as soon as the authorized attendant determines that authorized entrants may need assistance to escape from permit space hazards.

j- Taking the following actions when unauthorized persons approach or enter a permit space while entry is underway:
- ✓ *Warning the unauthorized persons that they must stay away from the permit space.*

- ✓ *Advising the unauthorized persons that they must exit immediately if they have entered the permit space.*
- ✓ *Informing the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.*

k- Performing no duties that might interfere with the authorized attendant's primary duty to monitor and protect the authorized entrants.

8.31 WORKING AT HEIGHT:

1- INTRODUCTION:
   a- Falls from height are the most common cause of death on construction sites. The site manager's responsibility is to provide staff with a safe place of work and includes the requirement to ensure that the employees are safe where there is a risk of falling from height.
   b- Working at height means working within 2m of an edge or opening, over or through which it is possible to fall 2m or more.

2- AIM:
   a- The aim of this document is to set the standards for working at height and to provide managers with guidance on how the standards must be met.

3- MANAGEMENT RESPONSIBILITIES:
   a- Managers must ensure that all activities which involve working at height are risk assessed and that appropriate steps are taken to eliminate or control the risks.
   b- Managers must ensure that all activities which involve working at height are subject to a "**Permit To Work**" arrangement.
   c- Managers must ensure that all the necessary equipment to ensure safe access to and egress from the place of work e.g. ladders, towers, scaffolds, cherry-pickers etc., is provided and used.
   d- Managers must ensure suitable plant is available to enable the materials used in the course of the work to be safely lifted to the work area and stored if necessary.
   e- When working at dusk, night or dawn, adequate local lighting is to be provided so that the work can be carried out safely.
   f- Managers must ensure that equipment used in conjunction with working at height e.g. scaffolds, ladders, harnesses etc., is regularly inspected.

4- SAFE SYSTEM OF WORK:
   a- General:
      - ✓ Activities involving working at height shall be planned in advance to anticipate potential problems and implement safe procedures.
      - ✓ Such activities shall be risk assessed such that the specific hazards are identified and appropriate controls implemented. If necessary, e.g. for non-routine work, especially where contractors are involved, a "method statement" shall be developed.
      - ✓ The general principles governing the selection of controls are as follows:
         1- *Removal of the hazard is a must i.e. wherever possible arrangements shall be made for work to be done at ground level.*

2- *Where working at height cannot be avoided, guard-rails and toe boards shall be installed.*
3- *Where guard-rails and toe boards are not practicable, safety nets or fall arrests shall be provided.*
4- *Safety harnesses are acceptable only after the above options have been considered and only where a secure anchor point has been identified;*
5- *Precautions must be taken to prevent falling objects e.g. tools, materials etc. causing injury to persons below.*

b- Ladders:

- ✓ All ladders shall be of a strong construction and well maintained. Homemade ladders are not acceptable.
- ✓ Ladders are a means of access and shall not be used as a workplace except for the shortest of jobs and only when it is safe.
- ✓ All ladders shall extend at least 1.05m above the stepping off point.
- ✓ Fixed vertical ladders shall be hooked when above 2.5m.
- ✓ Fixed ladders giving access to a place that is not fully protected by a guard-rail e.g. roof ladders, shall be locked to prevent unauthorised access.
- ✓ Portable ladders shall be securely tied at the top to prevent slipping. Footing is only acceptable if the ladder cannot be tied and is under 5m in length.
- ✓ Portable ladders shall be regularly inspected. The frequency of inspection will depend upon the conditions in which they are used but it shall not be less than once in every 6 months.

c- Tower Scaffolds**:**

- ✓ The person erecting the tower must be competent and certified.
- ✓ The tower must rest on firm level ground and the wheels/feet properly supported e.g. with timber bearers and base plates NOT bricks.
- ✓ Towers heights shall not exceed 3 x the smallest base width. If necessary, use outriggers to increase the base dimensions and/or tie the tower to the structure.
- ✓ When outriggers are used, all four legs must be in place at all times.
- ✓ Do not allow people to climb on the outside of the tower. Access shall be by either:
  1. A built in ladder; or
  2. A purpose made ladder attached safely on the inside.
- ✓ Tower scaffolds must be fully boarded at all times.
- ✓ Ensure that guardrails and toe boards are in place:
  1. Guard rails shall be at least 910mm high;
  2. To boards shall be 150mm high; and
  3. If the gap between the guardrail and toe board exceeds 470mm, an intermediary guardrail shall be fitted.

d- When moving the tower:

- ✓ Check that there are no overhead power lines or other obstructions.
- ✓ Raise the outriggers by the minimum necessary.
- ✓ Push/pull from the base only.
- ✓ Never move the tower with people or materials on the platform or in windy conditions.

i- Tower scaffolds shall be inspected prior to use and then regularly throughout the period of the project (not less than weekly).

f- Safety harnesses:
- ✓ Waist belt type harnesses are dangerous; in the event of a fall they can cause serious injury to vital organs. Full body harnesses shall be used when working at heights exceeding 2.0m.
- ✓ Safety harnesses are a form of PPE. As such they shall be the first choice of protection.
- ✓ Anchor points shall be secure and verified by calculation or testing. The anchor point shall be as high as possible, above the level of the user and never below foot level.
- ✓ Consideration shall be given as to how rescue the person in the event of a fall.
- ✓ Safety harnesses shall be inspected periodically.

5- TRAINING:

a- Managers shall provide any information, instruction and training that a person may require to carry out his task, trade or skill in a safe manner when working at height.

b- Training must be directed toward reducing the risk of falls of persons and objects associated with working at height. Persons who are required to work at height will need to understand the following:
- ✓ *The content of this leaflet.*
- ✓ *The safe systems of work to be adopted during work at height.*
- ✓ *The correct installation, maintenance and use of plant and equipment provided for use during the work.*
- ✓ *The requirement to report defective equipment promptly and the procedures for doing this.*
- ✓ *The effects of environmental conditions where work is undertaken out of doors.*

6- RECORDS:

a- Records shall be kept of all items related to working at height, which includes the following:
- ✓ *Maintenance of scaffolds, working platforms, ladders and steps.*
- ✓ *Details of competent persons responsible for supervising erection, altering or dismantling of scaffolds or for inspection of particular equipment.*
- ✓ *The results of the risk assessments carried out in accordance with Paragraph 3.1 above plus any review or revision made to working procedures arising from these assessments.*
- ✓ *Details of information, instructions and training provided to persons required to undertake work at height.*
- ✓ *Records retained on file are to be retained for a minimum of three years.*

8.32 IONIZING RADIATION: subcontracted activity

1- Ionizing industrial radiation, such as x-rays generated by equipment or gamma rays emitted by radioactive materials, are widely used in industry for non- destructive testing, e.g., testing of welds in pipes and pressure vessels, without damaging the material. The material tested does not retain any radioactivity when testing is completed.

2- For all practical purposes the radiation produced by x-ray equipment or emitted by radioactive sources are the same. X-rays and gamma rays both have properties which should be understood. Even though they penetrate the body, they cannot be perceived by any of our five sentences;
   a- They can be absorbed and scattered by matter.
   b- They travel in straight lines and at the speed of light.
   c- They ionize gases.
   d- They affect photographic emulsions.
   e- They can be harmful to the living cells of the body.

3- INSTRUCTIONS AND FORMS:
   Ionizing radiation protection.
   00-AID-08 Radiation safety manual.
   AB-36895 Radiation warning manual.

4- METHODS OF PROTECTION AGAINTS RADIATION:
   a- Distance, time, shielding are the usual methods of reducing radiation exposure.

1. Distance:

- Distance is the effective method of protection because gamma and x-rays obey the inverse square law that is the radiation intensity decreases with the inverse square of the distance. Conversely, dose rates at close distance can be extremely high, even for low activity sources. It is essential therefore that unshielded sources are kept at a sufficient distance from personnel so as not to pose a health hazard to them.

2. Time:

- Time is the use full method of protection because high dose rates can be accepted over very short periods of time. However, the cumulative dose must remain at acceptable limits given in GI 150.003-2.

3. Shielding:

- To lessen harmful radiation, materials of high density, such as lead, depleted uranium, or tungsten, are used to absorb emitted radiation.

- In the use of x-ray equipment, precaution against emitted radiation are necessary until the electric power is turned off and locked out. On the other hand, radioactive materials constantly emit radiation and cannot be switched off. Consequently, to absorb unwanted radiation and facilitate handling, sealed sources are housed in shielded containers or bunkers.

5- CLASSIFICATION OF PERSONNEL AND EXPOSURE LIMITS:

a- In order to control human exposure to industrial radiation, all employees are classified as radiation workers or non-radiation workers according to their training and the need to use radiation sources. Classification does not guarantee safety. Safety procedures and adequate equipment must be used at all times.

b- Radiation Workers:

- ✓ A radiation worker is an occupationally exposed person or employee whose job involves routine use of ionizing radiation and who has reasonable chance of being exposed to radiation from a radioactive source.
- ✓ Radiation workers are further categorized as competent persons or radiographers. Competent persons do not normally use radiation sources, but by training and experience, are capable of supervising both routine operations and emergency situations involving radiation. Radiographers are expected to safely use radiation sources in the course of their work and must be in the possession of a valid permit to use material/ equipment producing ionizing radiation before they can work with a radioactive source.
- ✓ Radiographers must wear two personal dosimeters when working with radiation, a direct reading pocket dosimeter and an integrating permanent dosimeter (film badge or thermoluminiscent dosimeter [TLD]).

c- Non radiation Workers:

- ✓ Non radiation workers should not receive more than the dose limits given in GI 150.003- 2.

d- Exposure Limits:

- ✓ Radiation doses to workers should always be kept as low as reasonably achievable (ALARA). Under no circumstances shall the doses exceed those limits given in GI 150.003-2 for occupational or non-occupational people.

e- Responsibilities of Safe Handling:

- ✓ The radiation protection committee has full responsibility in all matters concerning the safe use, storage and transportation of industrial sealed sources and x-rays machines. Persons involved in performing non-destructive testing must be certified and hold a valid permit to use material / equipment producing ionizing radiation.

f- Competent Person:

- ✓ Each radiographer will check at the beginning of each shift on the zeroing and recharging dosimeters and on the condition of the equipment. A competent person must be familiar with all the equipment and the

procedures such that the proper corrective action can be taken in any emergency situation involving radioactive equipment.

g- Radiographer:

- ✓ At the start of each shift, radiographers must ensure that all the equipment are in a safe working order. All malfunctions must be reported to the supervisor immediately. The radiographer must also make sure that he is wearing the valid TLD or firm badge and a direct reading pocket dosimeter which has been charged and zeroed. One radiation monitoring instrument must be available for each source in use. Equipment must be transported to the work place with safety locks in place. Under no circumstances the equipment is transported in an unassembled or open condition.
- ✓ Upon arrival at the work place and prior to operating with any sealed source, the radiographer must ensure that non radiation workers are not subjected to radiation levels that would exceed that which is permitted. Radiation area must contain radiation warning signs and must be clearly placed around the circumference of the radiation area. In addition and in populated work areas, a rope or tape barrier shall be erected around the radiation area. The area will be monitored with a calibrated and approved survey meter to ensure a safe area for non-radiation workers is maintained.
- ✓ A weekly report on the condition of all equipment shall be passed to the supervisor.

h- Shipping and Transportation:

- ✓ Transporting radiation sources to work locations requires a locked container located out of the passenger compartment. The vehicle shall have radiation signs on the front and rear.

i- Storage Areas:

- ✓ Upon completion of the work or at the end of each work period, every sealed source must be returned to a storage area. Storage is usually within a fenced area. Radiation readings must be taken at the perimeter of the storage area and the radiation level must be within the acceptable limits given in the GI 150.003. Radiation signs must be fixed to the barriers of all storage areas.

j- Radiography:

- ✓ Radiography (gamma) will be carried out by an approved subcontractor.
- ✓ The appointed subcontractor shall supply his own safety procedure.
- ✓ All workers shall comply with the requirements of the radiation safety manual.
- ✓ Radiography is to be carried out at times as agreed with the subcontractor.
- ✓ Radiography areas are to be clearly marked with tape, notice and flashing lights.
- ✓ An audio warning must be sounded to warn personnel that a source is about to be exposed

9. Emergency preparedness and response

9.1 Emergency preparedness procedures

A. *FOR FLOATING ROOF TANKS*:

a. FOR CONFINED SPACE *(Below The Floating Roof).*

1. In the event of a fire:
   - ✓ Extinguish the fire with the use of fire extinguishers.
   - ✓ Gather all the Fire Extinguishers and use them to extinguish the fire in the affected area.
   - ✓ If the use of the Fire Extinguisher is not necessary due to enormous fire, then evacuate the area immediately.
   - ✓ The attendant shall alarm all the workers working within the tank i.e. those who are working above the floating roof and within the tank perimeter.
   - ✓ The attendant shall double check and make sure that no one is left working inside the tank (below the floating roof) or in the affected area.
   - ✓ The attendant shall call, if necessary, the Nearest Fire Brigade Team at Telephone no. 02 _____ Ext. ___ and the ENCOCORP First Aid Team at _____ incase of an injury.
   - ✓ ***IMPORTANT: Do not use water to extinguish the fire if the source of fire is electrical or mechanical.***
2. In case of an injury:
   - ✓ *During the event:*
     1. The **conscious injured worker** must call the attention of the attendant or call the ENCOCORP First Aid Team directly at 05_____. The injured worker must specify his location e.g. inside the tank and his condition.
     2. If the injured worker has **no mobile phone or is unconscious**, his fellow worker must inform the attendant or ENCOCORP First Aid Team at 05_____.
     3. The **attendant** must call the ENCOCORP First Aid Team if everybody fails to do so. It is the responsibility of the attendant to make sure that everything is made known to the proper person in the event of an incident or an accident.
   - ✓ *Before the arrival of the ENCOCORP first aiders:*
     1. **If the injured is conscious**, he must be asked like: what does he feel and what happened to him. This can be done by his fellow worker present in that area.
     2. If he is suffering from a health problem like suffocation, dizziness, nausea, or vomiting due to low oxygen level as the case maybe, he must be moved out from the inside of the tank (confined space) to the outside of the tank immediately.
     3. If he is suffering from bone fracture, wait for the arrival of the ENCOCORP First Aid Team to apply splint and put the victim on the stretcher. Never move out a fractured worker by no means: no medical equipment, no application of first aid like splint etc.

4. If he is suffering from severe laceration (with bleeding) apply clean cloth and pressure on the affected area to minimize blood loss.
5. If he is suffering from burns as a result of explosion, move out the injured worker from the inside of the tank to the outside of the tank immediately. Have the worker expose to fresh air before the arrival of the ENCOCORP First Aid Team.
6. **If the injured is unconscious, and suspected of no injury**, move out the worker from the inside of the tank to the outside of the tank. Lifting should be done simultaneously on the head, shoulder, waist and legs. Never hold the back of the neck.
7. Lay the victim in a cool and shaded place with his head elevated. Check for the ***ABC – "Airways, Breathing and Circulation"*** if knowledgeable in doing so.
8. **If the victim is unconscious, and suspected of having an injury**, move out the worker from the inside of the tank to the outside of the tank slowly. Lifting should be done simultaneously on the head, shoulder, waist and legs. Never hold the back of the neck and as much as possible avoid body movements of the victim during carriage.
9. Lay the victim in a cool, shaded and flat surface with his head elevated. Check for the Airways, Breathing and Circulation if knowledgeable in doing so.

✓ *During the arrival of the ENCOCORP first aiders:*

1. The ENCOCORP First Aid Team must presumably respond to the emergency call on time with a maximum of five (5) minutes.
2. They should attend to the need of the victim by all available means.
3. It is the discretion of the Team whether or not they may require the service of the client (including ambulance).
4. The head of the team, who is the nurse, must inform the company HSE that the victim (please mention the name) be transported to the nearest Hospital immediately utilizing the client's ambulance.
5. The head of the team must assign somebody, of same race, to accompany the victim (with the use of client's ambulance) to the nearest Hospital.
6. ***IMPORTANT: The composition and the minimum requirements that the ENCOCORP First Aid Team should have are the following:***

   COMPOSITION OF THE FIRST AID TEAM

   A. Head of the Team: _____
   B. Assistants: 1. _____
      2. _____
   C. Driver of the vehicle: _____

MINIMUM EQUIPMENTS AND VEHICLE REQUIREMENTS:

A. Stretcher.
B. First Aid Kit.
C. SCBA (Self Contain Breathing Apparatus).
D. Service Vehicle of ENCOCORP.

- ✓ *After the event*
  1. The head of the team shall prepare a separate report (using the ENCOCORP Format) as a part of the data and information for the ENCOCORP internal investigation conducted by the Safety Supervisor of the company immediately after the incident.

b. FOR CONFINED SPACE (above the floating roof)

1. In the event of fire:
   - ✓ Extinguish the fire with the use of fire extinguishers.
   - ✓ Gather all the Fire Extinguishers and use them to extinguish the fire in the affected area.
   - ✓ If the use of the Fire Extinguisher is not necessary due to enormous fire, then evacuate the area immediately.
   - ✓ The attendant shall alarm all the workers working within the tank i.e. those who are working above the floating roof and within the tank perimeter.
   - ✓ The attendant shall double check and make sure that no one is left working inside the tank (below the floating roof) or in the affected area.
   - ✓ The attendant shall call, if necessary, the Nearest Fire Brigade Team at telephone no. 02 _____ Ext. ___ and the ENCOCORP First Aid Team at 05 _____ in case of an injury.
   - ✓ ***IMPORTANT: Do not use water to extinguish the fire if the source of fire is electrical or mechanical.***

2. In case of an injury:
   - ✓ *During the event:*
     1. The **conscious injured worker** must call the attention of the attendant or call the ENCOCORP First Aid Team directly at 05 _____. The injured worker must specify his location e.g. inside the tank #1 and his condition.
     2. If the injured worker has **no mobile phone or is unconscious**, his fellow worker must inform the attendant or ENCOCORP First Aid Team at _____
     3. The attendant must call the ENCOCORP First Aid Team if everybody fails to do so. It is the responsibility of the attendant to make sure that everything is made known to the proper person in the event of an incident or an accident.
     4. The attendant or the supervisor must call the attention of the Mobile Crane Operator and the Rigger Man. The Mobile Crane Operator and the Rigger Man shall direct their attention to the instruction of the attendant or supervisor.
     5. Before bringing down the injured, the instructions as mentioned below must be implemented:

- ✓ *Before the arrival of the ENCOCORP first aiders:*
  1. **If the victim is conscious**, he must be asked like: what does he feel and what happened to him. This can be done by his fellow worker present in that area.
  2. **If he is suffering from a health problem** like suffocation, dizziness, nausea, vomiting or heatstroke due to the heat of the sun as the case maybe, he must be moved out from his current position (could be on the upper deck) to the cool and shaded area at the ground immediately with the use of a basket and the mobile crane. Inside the basket, the victim must be accompanied by his coworker present in that area. On the ground, the victim must be laid down on the flat, cool and shaded place with his feet elevated. Cool water can be offered to the victim if necessary.
  3. **If he is suffering from bone fracture**, wait for the arrival of the ENCOCORP First Aid Team to apply splint before bringing down the victim. Never move out a fractured worker by no means: no medical equipment, no application of first aid like splint etc.
  4. **If he is suffering from severe laceration** (with bleeding) apply clean cloth and pressure on the affected area to minimize blood loss. The victim can be moved out from his current position to the ground with the use of a basket and the mobile crane. Inside the basket, the victim must be accompanied by his coworker present in that area. On the ground, the victim must be laid down on the flat, cool and shaded place with his feet elevated. Cool water can be offered to the victim if necessary.
  5. **If he is suffering from burns as a result of explosion**, move out the injured worker from his current position to the ground immediately with the use of a basket and the mobile crane. Inside the basket, the victim must be accompanied by his coworker present in that area. Have the worker expose to fresh air before the arrival of the ENCOCORP First Aid Team. Cool drinking water can be offered to the injured if necessary.
  6. **If the injured is unconscious, and suspected of no injury**, move out the injured worker from his current position to the ground immediately with the use of a basket and the mobile crane. Inside the basket, the victim must be accompanied by his coworker present in that area. On the ground, the victim must be laid down on the flat, cool and shaded place with his feet elevated. Do not let the victim drink water, as it may block the airways of the victim and may cause his suffocation.
  7. **If the injured is unconscious, and suspected of having an injury**, move out the injured worker from his current position to the ground immediately with the use of a basket and the mobile crane. Inside the basket, the victim must be accompanied by his coworker present in that area. On the ground, the victim must be laid down on the flat, cool and shaded place with his feet elevated. Do not let the injured drink water, as it may block the airways of the victim and may cause his suffocation.

Note: ***The lifting of the injured shall be done simultaneously on the head, shoulder, waist and legs. Never hold the back of the neck and as much as possible avoid body movements to the victim's body during carriage. Check for the Airways, Breathing and Circulation if knowledgeable in doing so.***

- ✓ *During the arrival of The ENCOCORP First Aiders:*
  1. The ENCOCORP First Aid Team must presumably respond to the emergency call on time with a maximum of fifteen (15) minutes.
  2. They should attend to the need of the injured by all available means.
  3. It is the discretion of the Team whether or not they may require the service of the client (including ambulance).
  4. The head of the team, who is the nurse, must inform the company HSE whether the injured (please mention the name) needs to be transported to the nearest Hospital immediately by the client's ambulance.
  5. The head of the team must assign somebody, of same race, to accompany the victim (with the use of client's ambulance) to the nearest Hospital.
  6. ***IMPORTANT: The composition and the minimum requirements that the ENCOCORP First Aid Team should have are the following:***

COMPOSITION OF THE FIRST AID TEAM

A. Head of the Team: _____
B. Assistants: 1. _____
2. _____
C. Driver of the vehicle: _____

MINIMUM EQUIPMENTS AND VEHICLE REQUIREMENTS:

A. Stretcher.
B. First Aid Kit.
C. SCBA (Self Contain Breathing Apparatus).
D. Service Vehicle of ENCOCORP.

- ✓ *After the event:*
  1. The head of the team shall prepare a separate report (ENCOCORP Format) to be based upon for the ENCOCORP internal investigation conducted by the HSE Officer/Supervisor of the company immediately after the event.

9.2 EMERGENCY EVACUATION PLAN:

A. IDENTIFICATION OF EMERGENCY

A situation, which has the potential to be classified and treated as an emergency, becomes apparent in any of the following ways:

a- An accident in which a worker(s) has sustained fatal injuries or death or significant property damage has occurred.

b- An automatic warning device has been activated by fire, smoke, heat and gas detection.

c- A fire or gas emission has been discovered and a manual alarm has been activated.
d- An individual is aware of a situation but unable to raise a general alarm.
e- Assuming that the situation is of such a magnitude that the individual who first became aware of it cannot safely provide immediate assistance to all personnel who may be injured or in imminent danger, then that person's responsibility is the immediate sounding of general alarm (if available) and notification to a senior person with the specific location and facts of the accident.

9.3 EMERGENCY EVACUATION ASSEMBLY AREA:

a- Designated emergency assembly points/safe assembly areas will be identified in conjunction with client's representative prior to start of any in-plant construction activities. Location of the specific assembly areas will be posted in jobsite, offices and will be informed to all employees.
b- If the designated assembly point is not accessible, for some reason (i.e. it is downwind or in close proximity to the scene of emergency) then, personnel must take a safety route away from the emergency location, toward an alternate assembly point, safe assembly area or an open area in a crosswind or upwind direction. At this point, time is extremely important that a head count is done to ensure all workers are accounted for.
c- Each supervisor will ensure all workers are accounted for. They will then report to ENCOCORP management and the client's representative will be notified that all are present and accounted for.
d- Drills will be conducted frequently as required in order to acquaint all personnel in the case of an emergency. This exercise will be coordinated with the client's proponent. Result of the drills will be recorded.
e- Immediate Evacuation / Site Restriction
- All affected employees, immediately upon having been alerted of the emergency, shall stop the work, shut down all equipment and quickly proceed to a predetermined safe assembly area.
- Nobody shall be allowed to return to site until after an instruction from the ENCOCORP or the Client's HSE has declared the "All Clear" status of the site.
- Equipment/vehicle entry points into evacuated areas shall be immediately posted with a Watchman to warn/deter outside personnel from entering the area.
- When driving: Upon hearing the "Stop Work Alarm" or "Disaster Siren", park the vehicle at the right side of the road (clear of hydrants, etc.) stop engine, leave the key inside the vehicle and readily proceed to the nearest assembly point in a cross or upwind direction and stay in the area until after the "All Clear" alarm is sounded or an instruction from plant operation is received.

f- Site development monitoring
- The ENCOCORP Project Construction Manager and HSE Manager shall keep in touch with the CLIENT until such time the emergency is under control and site normal condition resumed. Any development from the incident requiring further action e.g., total pull out from the plant as may be necessary, will be taken/relayed to the site employees accordingly.

10. Accident incident investigation

10.1 Incident Essential Requirements

The company recognizes as incident, the situations mentioned by the H&S risk assessment.

The H&S incidents are classified by severity levels according to the "H&S Risk Analysis Methodology". These are defined as follows:

✓ **Low: Incidental**
HS: Minor injury (First Aid), or minor illness with limited or no lost time.

✓ **Medium: Critical**
HS: Major injury or multiple minor injuries, or occupational illness limited to 3 days medical report, or local assets damage with partial shutdown

✓ **High: Severe**
HS: Single fatality and/or permanent total disability, or acute occupational illness requiring high level medical treatment, or major assets damage with partial operation loss

10.2 Incident Reporting

H&S Incident report shall be elaborated by the H&S Officer and reported to the H&S manager. An "HS-FO-001 & HS-FO-002" shall be completed and emailed.

All incidental incidents should be reported to H&S manager on weekly basis by the (HS-FO-03).

The H&S manager will elaborate the quarterly report including all the information and present it to the management.

10.3 Incident Investigation

H&S manager shall respond to reported H&S incidents by organizing an incident investigation and providing advice as H&S specialist to identify the root cause and all contributing factors.

In coordination with the H&S committee, the following shall be determined:

- Investigation team composition,
- The need for external expertise,
- The incidents that required investigation,
- The need for investigation of near misses.

The team shall investigate the root cause of the event that initiated the chain that leads to an incident, incl.:

- Failure of equipment, procedures or other management system that made the incident more likely or made the consequences more severe.
- Human failure (error) that made the error more likely, including work stress, poor communications, lack of correct equipment or procedures, lack of training, lack of skills or lack of knowledge.

Investigation report shall include the following main information:

- Type of the incident and details of the event.
- Details of any injured person: gender, experience, training etc.
- Description of circumstances: place, time of day, and conditions.
- Consequences: people, and assets.
- Details of the investigation outcome, incl. identification of root causes.
- Potential consequences: recurrence potential and severity potential.
- Recommendations, incl. prioritized actions with deadline dates, nominated action parties and responsibilities.

Other important information required in the reports is:

- Coordination with emergency plans and procedures, where appropriate.
- Persons responsible for the investigation, and competency requirements.
- Arrangements for witness interviews.
- Photographic and other evidence.
- Reporting arrangements.

Conclusions of incident investigations should be communicated to all relevant Department employees, H&S committee for sharing lessons learned.

H&S manager shall maintain a record of the reported incident and respective investigation results to incorporate in performance statistics and present in Management Reviews.

10.4 Incident Follow-up

Incidents should be followed up by H&S manager to make sure that essential corrective and preventive actions in the H&S Management System are identified to prevent, or minimize the risk of, a similar incident occurring again.

Then actions should be initiated, according to the requirements of the "Non-Conformity and Improvement Actions" procedure.

10.5 SAFETY INSPECTION

A comprehensive safety inspection program will be initiated and maintained throughout the mobilization, execution, demobilization phases of the project by Contractor and Client with the following as basis:

a- Continuous job surveillance by responsible supervisors.
b- Daily walk around by HSE Representatives.
c- Weekly site inspection by HSE Representatives.
d- Monthly General inspection by HSE Representatives and site management.
e- Monthly fire protection Inspection by HSE Representatives.
f- Monthly Camp Inspection by HSE Representatives and site management.

10.6 SAFETY REPORTS AND RECORD

1- Safety reports and records include but not limited to:
   a- Accident reports.
   b- Accident investigation reports.
   c- Near –miss report.
   d- Routine site safety inspection report.
   e- Records of medical treatment and first aid.
   f- Fire extinguisher inspection log.
   g- Training records, including toolbox talks.
   h- Project safety statistics.

2- Safety reports will be maintained by HSE Representative in conformity with an approved format and submitted on a monthly basis.

3- Safety reports will be stored appropriately onsite and be made available only to authorized personnel.

11. NC, Corrective and preventive action procedure

11.1 Identification of Non-conformities

H&S management system non-conformances can be identified in the following situations:

- ✓ incident reports,
- ✓ Internal audit results,
- ✓ inspection results,
- ✓ complaints or claims,
- ✓ Results of evaluation of compliance,
- ✓ Simulation of emergency procedures,
- ✓ Monitoring & measurement results.

11.2 Analysis of Non-Conformities:

The identified non-conformance shall be subject to investigation depending on the nature and complexity to identify the root cause and assess the level of risk.

The site manager should conduct the first investigation and communicate the result of the NC to the H&S committee

The H&S committee shall investigate when repeated significant non-conformances of the same nature have been identified;

For incident investigation method, please refer to Incident Management Procedure.
The description of the non-conformity and results of analysis shall be recorded in the "Improvement Action Form".

11.3 Initiation of improvement actions:

An improvement action may be initiated by:

- ✓ H&S committee,
- ✓ internal or external auditor and/or inspectors,
- ✓ external experts or contractors/suppliers.

11.4 Review of Improvement Action

In case of non-conformance, the H&S committee shall review the proposed improvement action and follow its validity.

If request is not appropriate, the requester should be notified with the reason.

While selecting control measures The H&S committee shall review the risk analysis if new or changed controls are identified prior to implementation, based on Risk Analysis Procedure.

11.5 Action plan development

H&S Committee sets the priorities, deadlines and defining responsible employees.

If needed correspondent specialist can be invited for discussion for potential solutions.

If potential actions require investments, the H&S Committee shall submit it to the Top Management for review, selection and approval of the appropriate solution.

Top management can reject the improvement request.

For implementing the required improvement actions, responsibilities shall be assigned and information communicated to concerned personnel by H&S committee with respect to the deadlines.

11.6 Improvements Actions implementation

The H&S committee shall monitor the implementation and effectiveness of all improvement actions and refer any concerns to the relevant Responsible.

The H&S committee shall review the risk analysis if new or changed hazards are identified during the monitoring or evaluation activities, based on Risk Analysis Procedure.

11.7 Review Improvements Actions Effectiveness

Improvement Actions' effectiveness shall be assessed by an appropriate indicator.
When actions have been implemented and have positive results, the H&S committee shall close the Improvement Action Request by marking it as completed.

The Improvement Action Register shall be presented during Management Reviews.

12. H&S Internal audit procedure

H&S management system internal audit is subcontracted to a third party to conduct it quarterly:
The third party service provider should provide ENCOCORP with:

- ✓ Certified internal auditors for OHSAS
- ✓ Internal audit program,
- ✓ Internal audit plan,
- ✓ Internal audit report,
- ✓ Corrective & preventive actions,
- ✓ Improvement plan,
- ✓ Follow-up on the implementation of the improvement plan.

13. Management Review

13.1 Management Review Methodology and Frequency:

Top Management of ENCOCORP reviews the H&S Management System once a year.
MR meetings are attended by the Managing Director and H&S committee defined per branch. However, other managers, supervisors and or external parties may be invited to the meeting at the discretion of the management.

13.2 Management Review Agenda:

MR meetings shall be scheduled by the H&S committee.

Reviews may be conducted in one or several meetings throughout the year but shall cover at minimum the following topics:

- ✓ follow-up actions from previous MRs,
- ✓ review of the H&S policy and objectives,
- ✓ results of H&S internal and external audits,
- ✓ results of employee participation and consultation,
- ✓ communication(s) from external interested parties and suggestions,
- ✓ H&S management system performance, and risk assessment matrix, including results of monitoring, measurement and changes in significant H&S Risks/Impacts,
- ✓ the extent to which objectives have been met,
- ✓ status of incidents investigations and improvement actions,
- ✓ Decisions and recommendations for improvement.

13.3 Management Review Outputs:

The outputs of the reviews shall consider the continual improvement of the H&S MS, therefore the minutes shall mention all decisions or actions, timeframe and responsibilities related to the following:

- ✓ Conclusions on the conformity and effectiveness of the H&S MS,
- ✓ Decisions related to H&S MS performance improvement,
- ✓ Changes to the H&S policy and objectives,
- ✓ Decisions related to any need for changes to the H&S MS, including resources.

The “NC and Improvement Actions” procedure shall be followed to plan and implement changes or improvements determined during the MR.
Minutes of meetings shall be prepared by a member of H&S Committee or a designated person.

The Minutes of Meetings of the reviews shall be classified and clearly marked as “strictly confidential” and shall not be available to external parties unless authorized by the Managing Director. Nevertheless, Health & Safety outputs shall be made available for internal and external communication and employees’ consultation.

Copies of minutes should be distributed to all attendees and relevant invited persons.