

*AL HAMRA KUWAIT COMPANY W.L.L*

REGISTER OF COMMERCE NO. 16278

FIRST GRADE CONTRACTOR IN CTC NO. H4-6050

# **General Safety Policy**

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# **HEALTH, SAFETY & ENVIRONMENTAL PLAN**

## **1. INTRODUCTION:**

**Al-Hamra Kuwait Co.** is guided by the established 'HSE' policy in all its operation. It has a sincere desire to eliminate personal injuries and damages to property and equipment. It believes that a good HSE performance is an integral part of efficient and profitable business management.

**Al-Hamra Kuwait Co** wish to achieve high industry standards in health and safety practices and environmental standards providing healthy and safe operations, improving environmental performance by reducing emissions wastages, incorporating best practical pollution control, respecting the interest of our neighbors those who live or work in the vicinity of our operations.

**Al-Hamra Kuwait Co** Management and field supervision are charged with the responsibility for planning safety into each work task and for avoiding incidents, conditions and actions that could lead to occupational injuries or illness. The management feels its responsibility that health, safety and environmental rules and procedures are established and enforced and that effective training programmes are employed to the best advantage, while the success depends on the attitude and full co-operation of each individual employee

**Al-Hamra Kuwait Co** during its operation ensure that underground facilities like water line, telephone cables, electrical cables, gas lines or any other installations in the area of work is properly protected. If any damage occurs during the course of work it will be reported to concerned authorities. We suppose our programme to be most effective and help us to achieve our goal.

Our goal is the total elimination of accidents from all our operations. There are three sound reasons for this goal.

1. A worthy business endeavor need not cause human sufferings through disabling injury, occupational illness or loss of life.
2. A Superior HSE record reflects the superior professional competence and serves to promote business, thereby contributing to the continued growth and success.
3. Accidents experience increases costs and result in loss of profit.

## **2.a. Al-Hamra Kuwait Co SAFETY POLICY STATEMENT**

Our Policy is to accomplish our work in the safest and healthiest possible manner. The management and supervisor at every level are charged with the task of integrating this objective into positive and productive business practices.

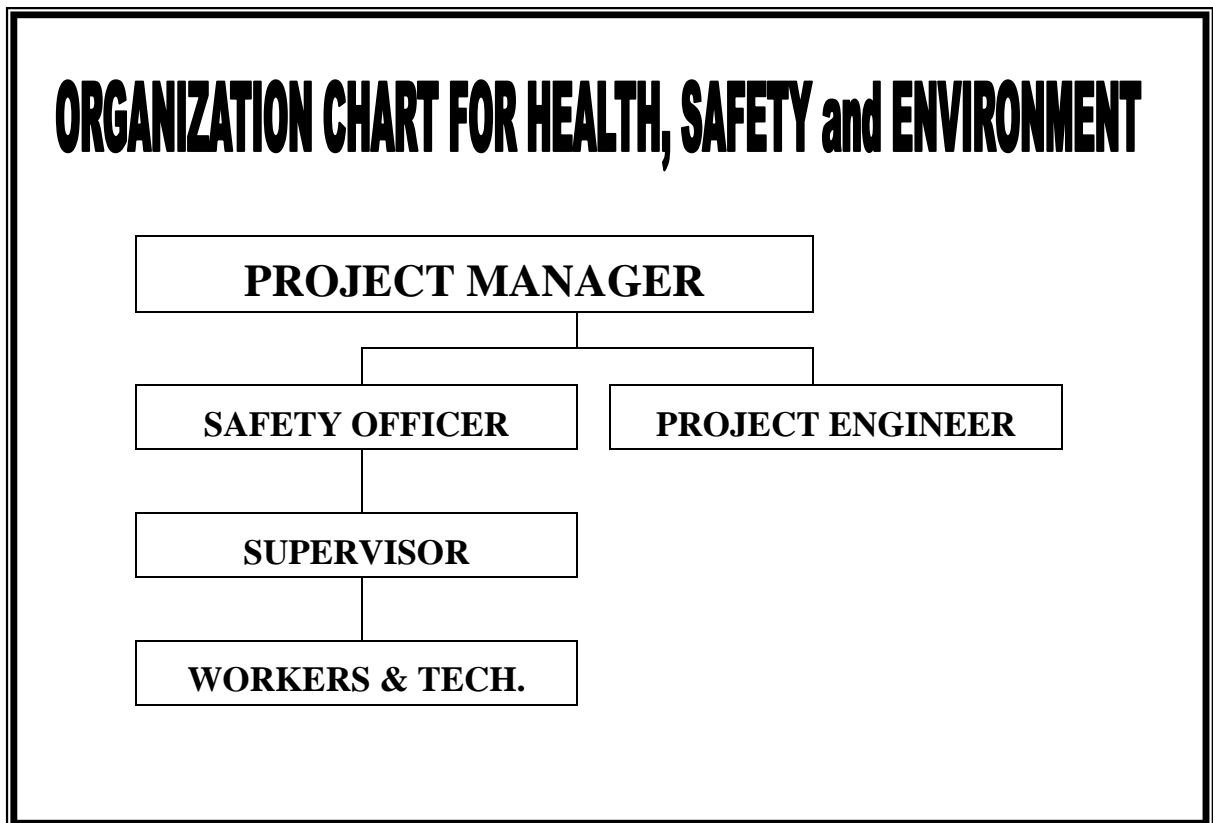
## **2.b. Al-Hamra Kuwait Co ENVIRONMENTAL POLICY STATEMENT**

**Al-Hamra Kuwait Co** reaffirms its commitment to minimize the adverse impact of its operation on the environment. Towards this end, it shall endeavor to:

1. Set sound environmental objectives and targets and integrate a process of review as an essential element of management.
2. Operate facilities to comply with applicable environmental laws and regulations.
3. Phase out pollution prone process, evaluate recognize and prevent hazards, minimize wastages and strive continuously for improved environmental performance.
4. Develop an environmentally aware workforce.

General Manager Signature

3. SAFETY ORGANIZATION:



## **1. OBJECTIVES:**

This document describes the organizational safety responsibility and commitments.

## **2. ROLE AND RESPONSIBILITY OF INDIVIDUAL:**

### **PROJECT MANAGER**

He is the main representative of General Manager to manage all activities including safety and environment at site. He is responsible for providing all resources, facilities and ensure through coordination and visits that high standards of safety and environment comply with [Kuwait municipality safety](#) standards.

He can question directly to any authority whether it is Project Engineer, Safety Officer or Supervisors in matters related to Health, Safety and Environment. He is over all responsible for all activates on site.

### **SAFETY OFFICER**

1. He is fully committed to safety and environmental activities.
2. He draws a safety plan in consultation with project engineer, develop safety programmes.
3. To create safety attitude in workforce through training and meetings.
4. To locate unsafe condition, practices and acts and to suggest and implement remedial measures.
5. To coordinate for construction equipments / vehicles inspection.
6. To investigate and report accidents.
7. To maintain records relating to safety activity.
8. He has to report Project Manager in matters related to Health, Safety and Environment arising during the Contract.
9. He must be fully versed with the [Kuwaiti Fire & Safety Regulation](#) as well as to the [Kuwaiti Health and Environmental Guidelines](#).

### **PROJECT ENGINEER**

He has a direct rapport with safety officer, supervisor and workers. He should be safety conscious and very much concerned with the safety aspects of his project. He will make inspection with safety officer. Provide resources for safety. He should also report the PM in matters relating to HSE activities.

### **SUPERVISORS**

They have the most vital role to play in safety as they are directly in contact with workers on site. Moreover being educated and experienced person they can analyze the job and make safety suggestions. They should see that no work is performed without safety. They will help safety officer in conducting investigation.

## **WORKERS**

Their role and responsibility toward HSE is the most important. They should be safety conscious. They will use all the safety appliances, which is needed in their job. As they are the persons closely associated with the job they can easily trace out the hazard and inform their supervisor and safety officer.

### **4. OBJECTIVE OF THE SAFETY SECTION:**

- a) To draw safety plan, develop safety programmes to create safety attitude in the workforce, implement safety practice.
- b) To provide safety training to its workmen
- c) To arrange and coordinate safety meetings
- d) To coordinate for construction equipments/ vehicles inspection.
- e) To investigate and report accidents.
- f) To maintain records relating to safety activity.

### **5. SAFETY TRAINING:**

#### **1. OBJECTIVE**

It is to create general awareness among employees to the need for safe working habits and to cultivate within them an attitude towards safety.

#### **2. SCOPE**

In all work related activities, safety programme / plan of all awarded contract.

#### **3. RESPONSIBILITY**

Project Manager and Safety Officer are assigned with the training of employees.

#### **4. PROCEDURE**

All personnel will be given training covering the following aspects.

- i) Every personnel will be made aware with the safety plan at site.
- ii) All healthy working practices like house keeping, material handling, health hazards, work related techniques, and unsafe acts, unsafe practices and unsafe conditions will be made aware of.

- iii) The training will be imparted in small batches, the depth of explanation, communication languages or methods will be adopted depending on participants.
- iv) The training may also include with reference to any major accidents or near misses and personnel will be guided how to avoid and prevent their recurrence.

## **6. SAFETY MEETINGS:**

### **OBJECTIVE**

The objective of safety meetings, are to provide a review of weekly work, its outcome and matters of special concerns arising during execution of work.

### **SCOPE**

In every contractual job awarded to our Company.

### **RESPONSIBILITY**

The Safety is the responsibility of the safety officer, site in-charge and supervisors at site.

### **PROCEDURE:**

- a. A regular Safety meeting will be conducted once a week at least for 15 minutes at work area (Tools Box area) and all employees at site will have to attend it.
- b. The meeting will review previous weeks work and will cover any accident / incident that occurred, any unsafe act or practice or conditions observed at site.
- c. In exceptional cases the Project Manager / Safety officer may call any special meeting if felt necessary to inform about any major concern or accident.
- d. All meetings will have good presentations and preparation is essential to ensure that the meeting has value.
- e. Workers will be involved to comment or question on work process or potential problems which they come across during the course of work
- f. A brief recording of the minutes of meeting is to be kept.

## **7. NEW EMPLOYEE SAFETY ORIENTATION:**

Each & Every employee of Combined Group Company and of its subcontractor prior to starting work will have to attend a safety orientation class which will briefly cover the following topics.

- a) Mandatory rules and regulations.



- b) Special Craft requirements
- c) Use of personnel protective equipments
- d) Accident and fire prevention.
- e) Vehicle & Equipments in operation.

As the work may involve new field of employment it may also involve new work methods he might be unfamiliar with the task so he will be advised to ask his immediate supervisors and the supervisors are assigned to direct and manage the operation of the new crew members. Each employee will be provided with personnel protective equipments, which his job demands and they would be accountable for its use.

They will be acquainted with the unsafe acts, practices and conditions and advised to be conscious:

The basic teachings on Hazards at site its effect on health and how to overcome and eliminate stress caused due to them. They will be guided in such a way that a positive attitude towards safety is developed within them and lastly their sincere cooperation will be called for making healthy safety records.

## **8. MONITORING OF SUBCONTRACTOR ACTIVITIES:**

This project involves only one subcontractor who is given the job of manual excavation.

- i. He must be made aware of the underground facilities where excavation is to be made through area map and comments made by different agency in excavation notification and also by using metal detectors.
- ii. He must be made aware of the Hazards of the site and basic feed back to its workers should be given in site meetings.
- iii. He should comply with the norms of the work permits.
- iv. The site supervisor of the company must continuously monitor his activities.
- v. His men at work should be provided the necessary work permit and passes for access to the site.
- vi. It must be ensured that all his workers are using personal protective equipments and are safety conscious.

## **9. SAFETY INSPECTION & AUDIT**

### **1. OBJECTIVE :**

Our commitment towards an accident free atmosphere and to create an attitude towards safety in working environment can only be achieved by monitoring through safety inspection and audits.

## **2. SCOPE**

In all contracts awarded to the Company and in all their safety programme and plans.

## **3. RESPONSIBILITY**

The responsibility lies with Project Manager / Project Engineer, Safety Officers and all Supervisors.

## **4. PROCEDURE**

The Project Manager along with Safety Officer, site supervisors and foreman will carryout safety inspection periodically. It will include job hazard analysis. The area of inspection may include subcontractor work areas. For this a checklist is prepared which covers the unsafe acts practices and conditions with a view to facilitate inspection.

### **SAFETY AUDITS:**

It will also be carried out involving the site manager, engineer and safety officer. The frequency will depend on the nature and size of the project.

A format of safety inspection checklist is prepared to be filled up and kept with safety records.

## **10. UNSAFE ACTS, PRACTICES AND CONDITIONS:**

### **UNSAFE ACTS & PRACTICES:**

- a) Using of equipments by unqualified and unauthorized persons.
- b) Automatic start of machine and equipments secured or not. Holding, sliding, falling or drifting of materials secured or not.
- c) Shortcut methods or hurry to finish a work
- d) Warning devices or signals for machines, mobile devices in overhead work, excavations are proper.
- e) Safety devices are operative or not e.g. machine guards, speed governors limit switches, ground wires in power tools, safety tags and locks present or not.
- f) If any use of defective tools and equipments e.g. tools with loose and cracked handles, chisels with mushroom heads, ladders with cracked or broken strands, vehicles and equipments with defective brakes.
- g) Using of wrong tools e.g. pliers in place of wrench.
- h) Working in hazardous location e.g. working beneath suspended loads, beneath scaffoldings without toe boards working near a traffic lane without guards or lights.

- i) Proper shutdown, lockout for service or repair of equipments. No repair work to be allowed on moving, energized or pressurized equipments.
- j) Unauthorized riding of trucks, tractors, forklifts, motorized carts etc.
- k) Horseplay by workers e.g. jumpy workers, poking an unaware person etc.
- l) Compliance of Safety requirements by worker at site.
- m) Unsafe postures while lifting of heavy objects e.g. legs straight and back arched down to the load etc.

#### **UNSAFE CONDITIONS:**

- a) Absence or inadequate guards and safety device of machine.
- b) Absence of warning devices at site of potential hazards
- c) Storage of consumables and inflammable materials in hazardous and unauthorized areas.
- d) Vehicles, equipments and materials left unattended that they may roll.
- e) Tripping hazards, this may be caused due to poor house- keeping.
- f) Protruding objects in working area.
- g) Close clearance and congestion
- h) Harmful concentrations of toxic gases, injurious airborne chemicals, dust particles or oxygen deficiency in work environment.
- i) Improper storage and arrangement of tools, tackles and supplies
- j) Misuse or abuse of equipments and tools
- k) Illumination (Poor or too bright)

For any observed unsafe acts, practices or conditions the following procedure will be followed.

- a) Advice the person(s) and their supervisor immediately and point out the hazards / damages.
- b) Stringing hazard warning tape wherever necessary.
- c) Placing of isolation / not to be used tag on equipments not having guards etc.
- d) Record of unsafe act, practice or condition is made.
- e) Counseling the offending persons or taking appropriate action

While taking corrective action the following points shall be taken in to consideration.

- i) Lack of Job skill
- ii) Lack of tools and equipments
- iii) Inappropriate work environment
- iv) Improper safety attitude
- v) Just honest ignorance by workmen
- vi) Poor lighting or eye sight

If it is found that any of the above deficiency is present corrective action may follow immediately and the action taken will be discussed in toolbox meeting.

**11. SAFETY INSPECTION CHECK LIST**

**SITE** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**1. JOB SITE INFORMATION:**

**SITE INCHARGE** :

**PHONE NUMBER** :

**DATE**

**TIME**

**PERSONS MAKING INSPECTION:**

1)

2)

3)

4)

Sl. No.	Item Description	Yes	No	Adequate	Inadequate
1 a	Posting of Jobsite warning posers				
b	First Aid Equipment & Emergency vehicles available.				
c	Are Jobsite Injury records being kept				
d	Are Emergency Telephone numbers Posted. Police / Fire dept. / Safety / Ambulance				
<b>2</b>	<b>House Keeping / Sanitation</b>				
a	General Neatness of working area				
b	Proper Disposal of waste & Rubbish				
c	Passage ways & walkways clear with adequate lighting				
d	Waste container provided and used				
e	Adequate supply of water				
f	Sanitary Facilities adequate & clean				
<b>3</b>	<b>Fire Prevention</b>				
a	Phone # of Fire Department Posted				
b	Fire Extinguisher checked charged & properly classified				
c	No Smoking Posted & enforced where needed				
d	Waste Containers provided & used				
e	Oil Spills & grease on floor cleaned				
f	Fire Hazards checked.				
<b>4</b>	<b>Power Tools</b>				
a	Good House Keeping of storage place				

Sl. No.	Item Description	Yes	No	Adequate	Inadequate
b	Tools, cards, switches & Plugs in good condition.				
c	Properly Grounded				
d	All Safeguards in use				
e	Right tools used for job in hand				
<b>5</b>	<b>Motor Vehicles</b>				
a	Regular Inspection & Maintenance				
b	Valid License for operators.				
c	Brake, lights, sparks arrestor & other devices operative.				
d	Are back up signals provided				
e	Are fire extinguishers installed				
f	Personnel Carried in a safe manner.				
<b>6a</b>	<b>Excavation Notification</b>				
a	Has notification been raised and all concerning agencies have signed it.				
b	Does the excavation notification is accompanied by a map of the site showing underground facilities.				
<b>6b</b>	<b>Excavation &amp; Barricades</b>				
a	Are shoring and sheathing correct for soil condition.				
b	Are Road & Sidewalks protected and barricaded.				
c	Are warning signs in place				
d	Is equipments a safe distance from edge of excavation				
e	Adequate lighting provided				

Sl. No.	Item Description	Yes	No	Adequate	Inadequate
<b>7</b>	<b>Welding / Cutting</b>				
a	Are welders Qualified				
b	Screen, Shields, goggles, gloves & clothing.				
c	Electrical Equipments Grounded				
d	Power cables Protected and in good shape.				
e	Inspection of Fire Hazards				
f	Fire extinguishers charged and proper type placed.				
g	Inflammable materials protected.				
h	Gas cylinders chained upright				
i	Are cylinder caps in use				
j	Are fireproof retardants available at site.				
k	Does the welding machine and generator set has its cable properly insulated.				
l	Are the cable jointed properly by cable jointers. Are there any hot joint on the electrical cords.				
m	Whether male and female plugs and sockets are used on the welding machine or not.				
n	Are gas test performed at the site of welding.				
o	Does the gas test entered in hot work permit and does it allow safe work.				
<b>8</b>	<b>Personnel Protective Equipment</b>				
a	Eye Protection				
b	Face Shields				

Sl. No.	Item Description	Yes	No	Adequate	Inadequate
c	Respirators & mask				
d	Helmets & Hoods				
e	Gloves, Aprons & Sleeves of proper type				
f	Respirators for dust, sandblasting.				
g	Proper Ventilation when applying paint.				
<b>9</b>	<b>Gas Testing</b>				
a	Dragers Apparatus Present				
<b>10</b>	<b>Handling &amp; Materials Storage</b>				
a	Are Materials Properly Stacked or stored				
b	Are Passage way clear				
c	Are men Lifting Load correctly				
d	Are materials protected from weather condition.				
<b>11</b>	<b>Hoist, Cranes &amp; Derricks</b>				
a	Cables and sleeves inspected				
b	Check slings, chains and hooks				
c	Equipment firmly supported				
d	Equipment properly lubricated and maintained.				
e	Inspection and Maintenance log book present in the cab.				
f	Signals understood and observed.				
	<b>Comments</b>				



## **12. REPORTING OF ACCIDENTS / INCIDENTS**

HSE Monthly Report (Forms Attached) should be submitted on or before 5<sup>th</sup> of every month.

The procedure for reporting all accidents / incidents are as follows:

### **1. Minor Accident**

- a) To a person: It a person receives minor injuries with no loss of work time
- b) Damage to Equipment & Vehicles: Needing minor repairs.
- c) Any small fire: With a little or negligible loss
- d) Spill: this did not require any special disposal arrangement.

All the above referred minor accident will be reported to.

- i) Project Manager / Project Engineer

### **2. Major Accidents:**

- a) To a Person: injury to a person with lost work time or fatal
- b) Damage to equipments & vehicles: This needs major repair shutdown or garage repair or replacement
- d) Any gas leakage creating flammable atmosphere or explosion.
- e) Any spill more than one barrel.

All the major accidents are reported to:

- 1) Manager of Projects / Project Manager/ Project Engineer
- 2) Client for whom the work is carried out.
- 3) Near misses & dangerous occurrence are also to be reported in the above manner.

## **13. INVESTIGATION OF ACCIDENTS**

### **SCOPE:**

All accidents whether major, minor, near misses, dangerous occurrence, to a person, plant, vehicles spillage including any lost work day cases will be investigated.

### **PURPOSE:**

The purpose is to initiate corrective actions and to prevent recurrence in future.

## **PROCEDURE:**

- a) The supervisor at site with the help of safety officer will prepare an investigation report and forward it to authorities concerned.
- b) In case of personal injury medical aid is provided to victim.
- c) In case of serious accidents, site will not be disturbed until and unless inquiry is over.
- d) The investigation will be comprehensive, accurate and objective in order to determine the cause.
- e) Investigation will be based to answer the following queries.
  - A detail description of accident.
  - The person plant equipments involved and their state before accident.
  - Was there any disregard to warning notices?
  - Were safety rules and regulations observed?
  - Were the tools & tackles appropriate for the work?
  - Was the personnel involved trained in such duties.
  - Whether any unsafe condition existed.
  - Whether any contributory cause e.g. lacks of control ignorance, illumination, under the influence of alcohol etc.
  - The submission of witnesses.

The investigation will comment on remedial actions to be taken

## **14. FIRST-AID REQUIREMENT**

### **OBJECTIVE:**

This document is part of safety plan and is obligatory on the part of management to provide to its employee in case. They are injured while carrying out their duty.

### **SCOPE:**

Safety plan of all awarded contracts.

## **RESPONSIBILITY:**

The Project Manager and Safety Officer will be responsible for providing first aid to injured employees.

## **PROCEDURE:**

The Company will provide at all its site offices with first aid boxes containing materials, which can provide emergency requirement for an injured person.

- i) The Contents of the first aid kits shall conform to applicable good health standards and in consultation to a doctor.
- ii) All first aid items will be fully equipped before being given to field supervisors and will be checked weekly to ensure that the expended items are replaced.
- iii) First aid kits shall be fully equipped before being given to field supervisors and will be checked weekly to ensure that the expended items are replaced.
- iv) A log book is to be kept with each first aid box keeping a record of the circumstances of each accident as described by injured person showing time of accident as described by injured person showing time of accident, the exact location of the body part where injury was sustained, the name of witnesses to the occurrence and the area (place) of occurrence.

A List of inclusion of the first aid box is enclosed herewith.

## **MINIMUM RECOMMENDED CONTENTS OF FIRST AID BOX**

### **EMERGENCY SERVICES TELEPHONE NUMBERS & ADDRESSES.**

### **NAME PHONE NUMBER / EXTENSION OF NEAREST FIRST AIDER**

### **BASIC FIRST AID MANUAL**

Triangular Bandages	-	6
Crepe Roller Bandages 2"	-	2
Crepe Roller Bandages 3"	-	2
Adhesive Dressing (Band-Aid Type)	-	24
Roll surgical Adhesive type ½-1"	-	1
Packet individually wrapped sterile Wound dressing	-	1
Cotton Balls Packets	-	2
Iodine B.P 100 MI	-	2
Swabs Packets	-	2
Antiseptic Cream Tube	-	1
Eye Pads Sterile	-	4

Eye Drops Bottle	-	1
Optrex Eye Lotion Bottle	-	1
Scissors	-	1
Forceps	-	1
Safety Pins	-	8
Tweezers	-	1
Disposable Gloves Pairs	-	2
Aspirin Tablets Effervescent Packet	-	1
Panadol PKT	-	1

Inclusion of One First Aid Box

**15. ELECTRICAL WORKS SAFETY:**

1. Persons approved by the project management will only be authorized to carry out electrical works.
2. All work of an electrical nature or involving electrical equipment, cables etc will be carried out only after authorization from [project management](#) maintenance department on issue of valid work permit.
3. It will be ensured that no broken switches, plug and sockets would be used and all electrical equipments will comply with the Hazardous area classification.
4. It will be ensured that all portable electrical equipment before its use is approved by [project management](#) maintenance division.
5. It will be instructed in all job safety meeting that no unauthorized person will ever remove, tamper with or ignore safety tags or warning notices attached to equipments by maintenance department
6. Before any electrical enclosure is opened it will be isolated from supply, pad locking will be done and the key will be kept with any responsible person working on the equipment. Warning tags will be displayed and the system is checked by a voltmeter.
7. An ABC Powder fire extinguisher will always be kept near the place of work.
8. Precaution will always be taken that no person is subjected to electrical shock and if it happens he will be provided medical assistance without delay.
9. All the power tools and equipments will be properly grounded and insulated.
10. Metallic Ladders for electrical work will always be avoided otherwise it is suitably insulated.

11. Portable lights not exceeding 24 volts will only be permitted as hand lamps.

**16. SAFETY PRECAUTIONS TO BE TAKEN DURING FOLLOWING ELECTRICAL WORKS**

**A. OPENING OF JUNCTION BOX**

1. Only approved Electricians will be allowed to perform work.
  - a) Proper tackles will be provided and used.
  - b) When the junction box is above 1.5 meters, ladders with rubber mats will be provided and the rings and bottom support will be checked for ties proper condition.
  - c) The ladder will be supported by one person when the other is climbing.
  - d) The Electrician will not use dynamic force in opening Junction Box.

**B. CABLE LAYING, TERMINATION & CONDUITING.**

1. Approved person will conduct the job after ensuring proper safety.
2. The cables will be tested prior to lying in hazardous area.
3. It will be ensured that conduit pipe; ducts and pipes sleeves are free from sharp edges and burrs.
4. The end of cable will be sealed properly.
5. Cable rollers will be used at all ends while laying cables.
6. Cable drums will be shifted by using hydraulic jacks and trailers.
7. It will be ensured that there is no coiling or twisting of cables during lying.
8. Proper lugs, ferrules and insulator will be used during termination.
9. While laying overhead cables it will be ensured that workmen are using harnesses, safety belts and ropes provided to them by company.

**C. INSTALLATION OF J.B**

1. J.B frames will be checked for sharp edges.
2. The J.B frame will be fixed at a position, which is approachable.
3. Before welding the J.B it will be properly grounded.
4. Proper plug and socket will be used and loose termination will be avoided.
5. All hand tools utilized will be insulated and grounded.
6. NEMA rating will be followed.
7. Gasket bottling will be done.

**D. WORKING ON EXISTING JB**

1. After taking all necessary safety precautions and making available all consumables e.g. gaskets etc. work will resume.
2. Spare terminals will be fixed before starting re-termination.
3. All new cables will be identified before termination and J.B will be earthed.

**E. HOT CUT OVER AND PRE-COMMISSIONING:**

1. All general precaution will be taken.
2. The power supply will be isolated and system by passed.
3. Radio communication will be made between persons at field and control room.
4. All needed materials will be procured before starting the job.
5. Reinstating the wires will only be done after informing the operator at control room.

**F. ELECTRICAL SHUT DOWN WORK**

1. All safety precaution will be taken.
2. Before starting the job permit to be work will be procured.
3. Power supply to be isolated and system shutdown.
4. All safety precaution in welding and cutting job will be taken.
5. All connecting wires will be removed and insulated at the end.
6. All terminal strips which are not in good condition will be replaced.
7. J.B will be earthed before system energized.

**17. EXCAVATION:**

**OBJECTIVE:**

This document describes the work instructions to be followed for providing underground facilities, which are contractual without doing any harm to existing facilities.

**SCOPE:**

For underground work as awarded by contract.

## **RESPONSIBILITY:**

The Project Manager, Safety Officer, Site Supervisor and all persons involved in excavation.

### **Excavation Procedure:**

An excavation at a site needs the following requirements.

1. A certificate from the authorities that explosive ordinance check at the site is made.
2. An excavation notification is to be prepared and signed by different departments /divisions / sections having services involved in the particular area. A map is to be prepared by consulting the different agencies and after inspection of the location and assessment of the obstructions and facilities such as cables, cable markers, manholes, catch basins, fire mains, pipelines, foundation bases, structures, telephone cable, sewage and other underground facilities.
3. A work permit will be made which will be countersigned by authorities in accordance with the permit. A cold work permit is needed when the excavation is less than / meter using hand tools. A hot work permit is needed when excavation is more than / meter deep using excavators in restricted area.
4. All consideration and necessary precaution will be taken after assessing the nature of soil of the excavation site (good, medium or sandy soil), strutting, shoring and polling will be done as per the depth and nature of the soil.
5. The excavation, which is deep, will be battered down at an angle of 45° preventing it from collapse.
6. Only hand excavation will do in area where there are buried services.
7. The excavation if near a wall or structure will be supported or strutting will be done by an expert.
8. At the excavation, sufficient ladders will be positioned projecting a minimum of 1 meter above the edge of excavation (1 ladder for 5 persons).
9. Before excavation is started we will ensure that the site is properly barricaded and warning signs and flashers are posted.
10. All excavated materials will be placed at a distance of 1 meter from the edge of excavation.
11. It will be ensured that all vehicles and equipments are kept at a safe distance (At least 3 meters) from excavation edge to prevent collapse of wall.
12. Every day before the start of job excavation will be inspected of hazardous atmosphere especially H<sub>2</sub>s gas before workmen are allowed to enter the trenches and also especially after rain.

13. While using excavator we will ensure that a watch is kept on the rear of the machine while it is turning or reversing and also that units bucket turned towards the ground when not in use.

### **Hazards of Excavation:**

Excavation can result in serious injury, fatality or property damage due to the following causes and it is imperative that safety measures as described later shall be adopted to ensure safety of personnel and equipment.

- Collapse of earthwork due to lack of inadequate or weak shoring.
- Persons falling into excavation due to lack of barriers or inadequate fencing, warning signs and illumination.
- Soil from excavation not being thrown clear of the sides causing overloading and collapsing of the walls.
- Water seepage causing drowning or collapsing of walls, failure to maintain shoring, particularly after rain storm.
- Person working too close together causing hazards to each other.
- Asphyxiation and toxication from exhaust gases of running engines which contain CO & CO<sub>2</sub> that may have accumulated in the bottom of excavation.
- Asphyxiation by CO<sub>2</sub> that can be present in excavations by air stagnation through lack of ventilation, especially on low winds. Symptoms are dizziness, pounding in the ears, and shortness of breath.
- Toxic or flammable gases or liquids accumulation from leaking pipelines, buried hazardous materials or waste (e.g., leaded sludge) etc.,
- Exposure of foundations, effecting or collapsing the supported structures.
- Workers not being provided with or not using the proper tools for the job.
- Workers in the excavation being struck by soil or materials falling into the excavation.
- Falls through unsafe means of areas into or out of the excavation.
- Workers being struck by excavating machinery e.g., the bucket of the excavator.
- Vehicles or equipment that is too close to edge of the excavation, causing edge to collapse.
- Vehicles being driven into the excavation due to the driving errors, inadequate working signs, or the absence of stop blocks.
- Vibrations due to machinery and heavy vehicles in close proximity.
- Striking of services, e.g., electricity / communication cables and oil / gas pipes, utility pipes etc.,



## **18. PERSONAL PROTECTIVE EQUIPMENTS.**

The company for its employee will provide all safety gears to carry out their duties in a safe manner and without a mishap to themselves or others.

It is the duty of the employee to keep their PPE clean and in a good condition and any defect may be informed to supervisor for replacement. Specialized protective clothing and equipments will be provided to persons doing specialized jobs while chemical handling welding, tank cleaning etc.

### **1 Helmets:**

Safety helmets of approved types with chin straps for persons working in Hazardous area, construction work, demolition, excavation, in area where crane work is going on to protect work man from head injuries. Special helmets will be supplied when working with chemical, welding, sand blasting etc.

### **2 Clothing:**

Tight fitting overall to persons working on revolving machinery welders and other persons exposed to hot sparks will wear fire retardant overall.

### **3. Ear Protection:**

Where people are working in environment having high level of noise more than 85dB, they will provided earmuffs or plug.

### **4. Eye & Face Protection:**

It varies according to work so a correct protection will be used for a job at hand eye protection is given by goggle, visors spectacles.

Face and eye protection by face screens helmets or hand shields or fixed shields works like compressed air cleaning by high pressure jets, welding, grounding, metal cutting, handling of chemicals.

### **5. Footwear:**

While handling heavy materials metallic toe plate boots will be worn to protect toe injuries. In restricted area boots with studs a heel plates not to be worn.

Rubber boots or specialized boots are to be worn when handling chemical, toxic substance. No slop sole boot in slippery area.

### **6. Hand Gloves:**

As required by job leather gloves for welding job, rubber gloves while handling chemical jobs.

### **7. Safety Belts, Harnesses & Life line**

Working on elevated position or in confined space safety belts, harnesses & lifelines are used.

## **8. Breathing Apparatus:**

- a) Fresh Air Breathing Apparatus
- b) Self Contained Breathing Apparatus
- c) Air Line Breathing Apparatus.

Its use depends and varies from the nature of job.

## **9. Dust Respirators:**

Used where dust or spray pollution is there.

## **19. FIRE PREVENTION:**

This is an important aspect of work and this practice is to be followed by all persons within their area of work workmen on the following guidelines.

- a) The workmen will be asked to maintain a high standard of house keeping at their work site. If any gas, burning or smoke is smelled they will inform their
- b) Smoking is strictly prohibited in Hazardous area and nearby area. There are certain designated areas outside hazardous area where smoking is allowed but care is to taken that cigarettes and ....are extinguished in ashtrays provided.
- c) Jute, oily rags, waste and carbonaceous materials will be dumped in closable, metal containers provided at site.
- d) Paints, thinner, flammable liquid stored in store will be in minimum quantity with lids on the container.
- e) Spills of oils, hydrocarbons, acids or other chemicals will be cleaned and disposed in metal containers.
- f) Pyrophoric scale (iron sulfate) formed in metallic pipes due to presence of H<sub>2</sub>s and when pipe is cut or opened, these scale when come in contact with air is capable of auto ignition so it will be kept submerged in water where ever found.
- g) Dust when deposited may also become a cause of fire if allowed to accumulate so it will be necessary to clean dust before accumulation starts.
- h) Electrical supply at any place should not be allowed to be overloaded or it may be a cause of fire. This will be looked into by electrical people on routine basis.

20.

**FIRE PROTECTION:**

- a) The Company will provide adequate number of approved types of fire extinguishers (ABC Powder type).
- b) The work permits instructions regarding prevention and protection will be strictly followed.
- c) While performing welding in hazardous area welder and his helper is advised to keep the area free from oil spills, fire proof fabrics or metallic barriers to be put on combustible installation near the welding site. Moreover the welding area will be kept cordoned to prevent sparks from flying to outside area.
- d) When welding or cutting will be carried on height all care will be taken that sparks and welding rods from falling down. The area will be surrounded and installations, pipes etc. will be protected with fireproof fabrics.
- e) Any gas cylinder (oxygen or acetylene) when used for welding purpose will be kept at a distance from welding site and metallic barriers will segregate it.
- f) Water houses connected to hydrants and fire extinguishers will be kept ready at the site of welding prior to welding starts.

21. **PORTABLE FIRE EXTINGUISHERS:**

There are only three types of fire extinguishers commonly used at our sites.

1. **ABC Powdered Fire Extinguishers**

This is used as a “General Purpose” extinguishing agents. They have dry powder in very fine form. The existence of flame depends on a chain reaction from one burring molecule to the other. This fire powder prevents any further supply of oxygen from combining with the combustible material and thus extinguishes fire.

2. **CO2 Fire Extinguishers**

This is used for electrical fires only and small laboratory fires. No residue is left so it is best suited for indoor fires.

3. **Foam Type Fire Extinguisher**

They are generally used for fire in inflammable liquids. The foam forms a film on the liquid surface and cuts the supply of oxygen.

**Safety Procedures for handling Fire Extinguishers**

1. While using fire extinguishers one must not tackle difficult fire without back up support.

2. One should always be with the wind direction.
3. Send some one to raise alarm or if alone call for assistance first.
4. Fires should not be chased to avoid the flash back.
5. Never direct the pressure discharge into the burning liquid to scalper and enlarge the fire area.
6. While using CO2 extinguishers care should be taken that CO2 gas is not inhaled or will cause congestion of the lung.

There should be sufficient number of fire extinguisher at site and they shall be placed in such a position that they can be easily accessible. The approach to these extinguishers should be clean and safe.

## 22. **RADIATION HAZARDS:**

Radiography is used by contracting companies like us in non-destructive testing of welding joints in pipes. As we know that exposure to high doses of radiation may result in physical injury, malignancies genetic effects and even death.

In projects that exist in radiography zones, the responsibility lies with, Inspection & Corrosion division. So before performing radiography permission is taken from corrosion department.

- When work is to be carried out warning notices stating, “Radiation do not enter” shall be posted.
- Persons involved in handling ionizing radiation shall wear radiation dosimeter or T.L.D
- The instrument used must have its calibration checked within last six months and record shall be available.
- All reasonable practicable steps are to be taken to minimize the exposure of employees. Exposure must be kept as low as reasonably achievable.
- Dose limits must not be exceeded. Therefore a radiation dose rate meter is kept ready for immediate need.
- Medical records of the persons who are exposed to radiation hazards must be kept up to dated.

## 23. **SAND BLASTING:**

- a) Sand blasting is an operation, which requires very high standards of safety. As sand has very high percentage of free silica, which causes a very deadly occupational health disease, called silicosis, affecting human lungs? The precautions must be strictly adhered to and the persons involved in the operations are fully educated in its hazards and following precaution.

- b) Sand Blasting is carried out in enclosures where doors are closed and ventilation system is kept in continuous operation.
- c) No other person will be allowed to enter the enclosure except the sand blaster who is equipped with all safety equipments.
- d) The sand blaster is provided with the specific overall & gloves with the protective hood with regular supply of 6 cubic feet per minutes of air.
- e) The air supplied to the blasting helmet is through a compressor, the quality of air will be good and free from dust and hose supplying will be clean properly clamped to the hood.
- f) The helpers of hopper loaders or any worker within a vicinity of 20 meters from blasting will be provided with earplugs, goggles safety protective clothing and air filters.

## **24 PAINTING:**

As we know that most of the paints have lead as constituents which is a harmful metal and exposure to fines of paint may lead to paralysis? So we will see that following precautions are strictly taken.

- a) Painting should be done only in enclosures with exhaust fans in the back wall to draw fumes away from the painter.
- b) When painting will be done in restricted area adequate fire preventive measures will be taken and suitable fire extinguishers will be provided at site.
- c) When blowlamps or torches are used to remove paints dust respirators are provided to protect the painter from the dust inhalation.
- d) Suitable washing facilities to be provided to wash hand after painting or before eating food.

## **25. OIL SPILLS AND POLLUTION:**

Spillage of oil, chemicals or materials, which may pollute the ground, air or water or can create hazards to person's plant and buildings, will be dealt with and every effort will be made to stop and control it. The following safety precaution will be taken.

- a) When it is unavoidable to control small spills drip trays or large receptacles are provided.
- b) The leakage will immediately be located and repaired.
- c) The concerning authorities to be informed of the leakage.
- d) Precautions will be taken so that no incidents occurs due to spillage and fire extinguishers should immediately be brought to the spillage site (preferably foam type)

- e) Warning notices displaying the spillage site will be placed.
- f) Any spillage on ground soil must be removed quickly preventing it from seepage to the ground soil using appropriate methods as exigencies demand and contaminated soil, if any, will be removed instantly.

**26. TRANSPORTATION OF PERSONNEL & MATERIALS**

1. No person will be allowed to drive any vehicle without a proper driving license.
2. All traffic rules, regulations, speed restrictions traffic control signs, warning notices etc. will be followed strictly.
3. No vehicles will carry passengers more than its sitting capacity. No passengers will be allowed at the back of pickups unless it has sitting arrangement and is provided by a canopy.
4. All transport vehicles will be parked in approved parking place by project management.
5. Before loading or unloading any vehicles the engine will be switched off. The hand brakes set and if it is on an included plane the wheels must be chocked or the engine put to gear.
6. While transporting materials no materials will be kept protruded out until and unless safety tag with red flag is conspicuously placed.

**27. TOOLS & TACKLES:**

It is witnessed that a number of accidents occur due to poor maintenance of tools and tackles and also due to their un-proper handling. So it is imperative to use specific and well-maintained tools and the following precaution to be taken and the workmen will be accordingly instructed.

1. All tools will be kept clean and protected against corrosion and damage and adjustable parts to be lubricated to prevent wear and misalignment.
2. All damaged and worn out tools will be discarded and replaced.
3. Tools approved by work permits will only be used.
4. Spanners (ranged, tubular and opened) will be preferred to wrenches. If wrenches are used it will be of right type and size.
5. Punches and chisels will be straight and heavy with points accurately grounded and not with mushroom heads.

6. Proper tools for proper function e.g. screwdrivers will not be used as chisel or pillars as wrenches.
7. Files with proper handle and size.
8. Tools used for electrical works will be properly insulated.
9. Only brass hammers will be taken & allowed in hazardous area.
10. All power driven grinders will have RPM of their motor not exceeding the maximum speed of the wheel.

**28. ENTRY TO CONFINED SPACES:**

Confined spaces e.g. Vessel, tanks, fences, pit sewer and excavation more than 1.2 meter deep etc. have hazards of oxygen deficiency, toxicity of H<sub>2</sub>S and hydrocarbons presence of flammable materials. So for entering confined space certain safe practices are to be followed and insisted. Following are the safety precaution and practices.

1. The vessel or tank is isolated from its connection either through blinding or disconnection of pipes and spools.
2. All the man ways of access are opened and ventilation is provided. Air movers are placed at vent to free it from any accumulated gas.
3. Simultaneously gas testing is carried out when the permissible limit comes the tester will enter his finding on the permit and entry card with his signature. Regular testing of the vessel atmosphere is carried out.
4. Then two persons at a time wearing breathing apparatus of a capacity 1200 liters charged to 132 atmosphere and a distress signal unit with a safety belt and life line connected at the point of entry will enter the confined space with at least two rescue crew and one watch man standing out monitoring the gases and entering control board or book.
5. No person or crew allowed remaining inside the vent for more than 30 minutes.
6. If the watchman receives a distress signal or if the crew do not turn up after the stipulated time. The rescue crew will be sent inside to take out the persons.
7. All the work will be suspended during emergency.

**CONFINED SPACE HAZARDS :**

- Oxygen deficiency.
- Presence of toxic, corrosive or hazardous material (e.g., H<sub>2</sub>S, NH<sub>3</sub>, HC, S or C dust)

- Presence of flammable, combustible, explosive or pyrophoric material (e.g., sludge).
- Restricted access – limited number of entry or exit points (e.g., single man-way).
- Restriction to freedom of movement inside confined space (e.g., trays).
- Falling or tripping hazards.
- Poor illumination / visibility / communication.
- High temperature and humidity.

## 29. **EMERGENCY EVACUATION PLANNING:**

The emergency evacuation planning will be followed as per the general emergency procedures. The persons involved in emergency incident must know their role and responsibility and will maintain procedures for quick and effective response.

During an emergency, the management has the responsibility for implementing the emergency procedures.

An advance control organization set up by project management during emergency coordinates with the physical activities and operation. They decide the assembly point; maintain a record of all personnel present with the area. They will guide the persons through a public address system. All persons should immediately leave the area by shortest possible route and assemble at an assembling point.

The responsibility of contractor's employee is to follow the instruction of advance control organization.

The employee should know the assembly points through the evacuation map posted at their site office and also as per the instruction of their site manager who will remain in touch with them or any other person deputed for such work.

[Al-Hamra Kuwait Co.](#) will to keep enough buses with drivers to cater under such situation on the site. The nature and classification of emergency will be done by project management organization. Their telephone numbers and telephone number of other agencies should be kept posted in the office and also with responsible persons who will make contact during emergency. The preparedness should be made in an easy manner so that no panic is created.

## **GUIDE LINES & PLANNING:**



Since the inception of work at a particular site, the management considers its duty to educate its workmen of all possible hazards which may occur in due course of their routine job and they will be equipped with planning and procedures through education and drills. The highlights of procedure will be as follows:

- a) The workmen will be educated of the evacuation signal.
  - i) For partial evacuation signals will be 8 blasts each of 5 seconds duration with interval of 5 seconds of fire services.
  - ii) Total evacuation signal will be 16 blasts each of 5 seconds duration with interval of 5 seconds of fire services.

A group leader will be nominated from the workforce who will lead emergency.

- b) The transfer point, gathering point and route will be incorporated in a map prepared and explained.
- c) The route to the emergency gate and its key where kept will be known to every individual.
- d) Emergency route and an alternative route will be shown to them during drill exercise.
- e) The wind direction will be ascertained by windsocks located in the area and the workmen should know that it is safe to move against the wind.

**Follow up Actions:**

- 1) All persons will wear their identification badge immediately.
- 2) All persons will be directed to the transfer point.
- 3) All persons will move towards emergency gate after one person has picked the gate key from its designated place.
- 4) Vehicles if any present on site may be asked to proceed at the gathering point.
- 5) The leader will ensure that all of his men had reached the gathering point.
- 6) When “All clear siren” is heard the persons are directed back to work.

**30. MATERIAL HANDLING:**

Material Handling is a subject which has a wide scope in Petroleum Industries. The hazards related to it are causes of number of accidents. So consideration must be given to the methods used for loading, unloading, transfer, stacking destalking using materials.

How one should handle materials safety without strain. The personnel engaged in handling will receive adequate training before been engaged.

- a) The material will be inspected for burrs, slivers, rough and slippery surface.
- b) The correct method of lifting and carrying including team lifting and stacking methods of various type of materials.
- c) The correct item or protective clothing's to be used e.g. gloves, footwear etc.
- d) The use of portable mechanical equipments likes handing trolleys, wheeling barrows etc.
- e) The methods used to apply or remove wires strapped materials.
- f) To assess the size, weight & shape of the materials handled.
- g) Where cranes are used the employees should understand the signals used and will not stand below the load
- h) The handling of fragile materials, chemicals etc.

### **31. TRAFFIC SAFETY / DRIVING**

1. The person/driver must have a current valid driving license and authorized by transport and plant department.
2. The driver will be instructed to drive the vehicle as per prescribed limits.
3. The driver prior to plying his vehicle must ensure that his vehicle confirm to the safety requirements.
4. The safety officer will personally ensure that a vehicle has a fire extinguisher approved by fire and safety dept. and spark arrestor at its exhaust end and an automatic speed breaker.
5. The driver must shutdown its vehicle engine before refueling.
6. The driver while parking his vehicle will ensure that the breaks and gears would be kept engaged while parking especially at inclined position.
7. The driver will follow the traffic regulations and signals.
8. The driver is instructed against aggressive driving which not only exposes him but others to danger. He will drive as per the condition demands.
9. The driver will take care to be a defensive driver so that his attitude takes him safely to his destination.

## **OPERATION IN HYDROGEN SULPHIDE (H<sub>2</sub>S) ENVIRONMENT.**

### **Physical Properties of H<sub>2</sub>s**

- a) H<sub>2</sub>S is highly toxic, colorless gas, heavier than air, with a specific gravity 1.18 and thus settles down in pits, tanks, vessel etc.
- b) Burns in air with blue flame and produces sulfur dioxide (SO<sub>2</sub> which is also very toxic and can cause serious injury.
- c) H<sub>2</sub>S gas forms explosive mixture with air between 4.3% and 46% by volume.
- d) H<sub>2</sub>S gas is highly poisonous and can paralyze breathing system and kill in minutes.
- e) At low concentrations H<sub>2</sub>S gas has an offensive odor similar to rotten egg. At slightly higher concentrations, the gas may have a sick sweet odor. At high concentrations the gas rapidly deadens the sense of smell by paralysis of the olfactory nerve. So H<sub>2</sub>S gas cannot always be detected by the sense of smell.

### **H<sub>2</sub>S and Human Thresholds**

0.1 to 0.2 PPM	-	Approximate threshold for odor.
3.0 to 5.0 PPM	-	Offensive Odor
5.0 to 10.0 PPM	-	Threshold Limit Value for odor
50.0 to 100.0 PPM	-	Threshold of serious eye injury sense of smell decreases.
150 to 250.0 PPM	-	Total loss of sense of smell
300 to 500.0 PPM	-	Pulmonary Odema, imminent threat to life
500 to 1000 PPM	-	Strong nervous system injury, respiratory paralysis
1000 PPM or More	-	Immediate collapse, death in seconds.

### **H<sub>2</sub>S Detection:**

The detection for hydrogen sulfide (H<sub>2</sub>S) is a must to warn personnel from the impending danger of this highly toxic gas.

Generally a dragger apparatus is used to detect the presence of H<sub>2</sub>S.

### **Working Standards for H<sub>2</sub>S Safety:**

- a) All personnel at site will be instructed on the characteristics and perils of H<sub>2</sub>S and the precautions necessary to assure safety. All personnel will be trained and instructed to use self-contained breathing masks.
- b) During any H<sub>2</sub>S hazard all persons will be evacuated to safe breathing place during operation except those having self contained breathing mask .

- c) If not all persons, some persons will be trained for first aid relating to H2S safety and first aid.
- d) Wind direction indicators are located so that all personnel are able to observe the direction of wind.
- e) Before the work at site is started especially when working in pits , the safety officer will ensure through a digital portable detectors the presence of H2S if any and monitor it regularly.
- f) If the H2S reading is below 10 PPM, men can work but not more than 8 (Eight) hours. If the reading is more than 20 PPM men must not work with out breathing apparatus. If reading between 10 – 20-PPM preventive medical service can be consulted for duration of work.

### **33. PIPE LINE HANDLING / STORAGE**

#### **A. PIPE LINE HANDLING**

- i. No welding shall be done on pipes, which may have contained oil or gas until the pipe has been fitted with, and approved type of seal and gas tests have confirmed that the seal is adequate in accordance with the “ Work Permit” requirements.
- ii. Men employed in carrying out repairs on pipelines should be warned of the dangers of gassing. Special care must be exercised in entering any sump or pocket in the ground, in which gas may accumulate. Only authorized personnel shall be allowed to enter and check the gas levels before start of the work. In breaking lines, the men should be on the windward side.
- iii. All work requiring the opening of lines is to be covered by an appropriate permit.
- iv. Pits of sufficient sizes should be dug at a safe distance from the lines being opened and the spillage drained or pumped in to them. It should be subsequently disposed of in an approved manner.
- v. Draining pits, which will be used to dispose spillage from the pipe line, should be lined with an impervious membrane to prevent oil seeping to the underground.
- vi. After work completion, all the drainage pits should be cleaned, backfilled with clean sand, all the area has to be fit cleaned and the contaminated liner should be dumped out side in the area approved by municipality.
- vii. Men engaged in breaking the line should be warned to avoid being sprayed by the escaping oil. They should wear suitable protective equipment.
- viii. When performing hot tapping, the approved hot tapping procedure shall be followed. All necessary hot work permits to be obtained.
  - Fire Blanket shall be provided with adequate fire extinguishers.
  - Explosive Gas levels shall be monitored at all times.

- Labor force shall wear safety wear, hard hats & gloves at all times.

- ix. Suitable fire and safety equipment as recommended by the Client should be provided at the location.

### **PIPE DISMANTLING:**

Dismantling pipes for repairs or replacement must be done with caution. Check to make sure that the line has been depressurized and that a valid permit is obtained.

When cold cutting a pipe, use a pipe cutter or water-cooled saw. Use the cutter slowly and prevent the pipe from snapping apart.

Allow any residual product in the pipe or drain out and flush the line before performing any hot work such as welding.

Piping must be stoppled or plugged, gas tested, before grinding, welding, torch cutting or using other sources of ignition.

When opening a line at flange loosen or break the bolts in an every manner. Bolts should be loosened at opposite sides of the piping to evenly distribute pressure in the flange. Do not loosen bolts in a clockwise or anticlockwise manner, as this will put strain on flange.

### **B. PIPE STORAGE:**

1. Separate pipe rails for different size and schedules to be made.
2. Pipe storage area to be kept clean
3. The storage area should not be crowded and there should be room for large trucks and cranes movements.
4. A physical count of the pipe should be made on a weekly or monthly basis to verify material accounting records.
5. The measuring of the pipe should be done within tenth of an inch. The entire length of the pipe is measured including couplings and threads.
6. The stack of pipe is made secured by railing wooden blocks Pie racks are made by using timbers.
7. to the sills against the side of the pipe.

## **34. EOD AWARENESS AND TRAINING**

After Iraqi Invasion a large amount of unexplored ordinance were to be found in all areas of Kuwait. The Kuwait Ministry of Defense (KMOD) since liberation started explosive ordinance disposal programme. Though a vast area had been cleared but still 100% disposal is not guaranteed due to reasons like shifting of sand, excavation and oil lakes.

Some protective action and procedures had been formulated to ensure protection of personnel and property, which are as follows.

1. Contractors should start work only after getting EOD clearance and its importance to be explained.
2. Personnel should be made aware by requesting Fire & Safety Dept. (client) to made EOD presentation, which is mandatory.

Before starting our work we should confirm the following:

**1. EOD Certification:**

Written confirmation should be obtained to authorize work to proceed in a certain area with a map of the area and counter signed by Ministry of Defense, Kuwait.

**2. Action on finding suspected Explosive Ordinance.**

- a) Not to touch the explosive
- b) Work should be stopped immediately
- c) The place to be marked by marker at a safe distance.
- d) Burgan fire station to be informed immediately.

Oil lakes and minefields should not be entered for excavation, as in these areas explosive ordinance is un-cleaned.

**35. ACCESS CONTROL AND SECURITY**

Access to restricted and Hazardous area is controlled by access control department which provides passes and permit to enter the area and carry out work for personnel and vehicles. There are a number of permits, a brief of which is summarized below:

**i. Work Permit System**

- Working in a petroleum field including hydrocarbon and toxic material presents serious risks. In order to provide safe-working conditions, a work permit system shall be followed. The work permit specifies the conditions and procedures for safe execution of the work and allows the work to be carried out under controlled conditions.
- The basic purpose of work permit system is to assign each party for the safe execution of the work; i.e. prevent injuries to personnel, protect property from damage, avoid fire explosion and ensure that all work is carried out in the safest possible manner.
- The work permit authorizes specific work to be carried out in restricted or hazardous areas and serves as an official written record of condition and requirement as agreed upon between the persons authorizing and receiving the permit.
- The conditions set out on the work permit are meant as a general guide and shall not be assumed to cover every condition of circumstances that may be

present or may arise during the course of the work. The permit in itself does not make the job safe but shows to what intention the job has been made safe.

## ii. Type of permits

### 1. Cold Work Permit

A cold permit shall be obtained for all general works that do not involve activities related to hot works, i.e. the tools and equipment used or the work itself do not generate any spark: Ex.

2. Routine maintenance, inspection and condition monitoring activities using non-sparking hand tools, intrinsically safe instruments or explosion proof equipment.
3. Excavation by hand tools, erection of scaffolds and barricades, chemical cleaning and use of air driven power tools, which do not generate sparks during use.
4. Opening of process equipment such as vessels, towers, pumps, compressors, heat exchanger, fitters, tankers, etc.
5. Blinding (spading), blanking, breaking of flanges and unions, tightening of flanges, hot bolting, tapping, cold cutting, hot work preparations, etc.
6. Industrial radiography using ionizing radiation source.

#### Notes for Guidance:

Before authorizing the issue of a **Cold Work Permit**, factors such as the following must be taken into account:

- Are equipment, plant and location free of oil, gas and vapor?
- Has equipment been depressurized?
- Are the equipment, plant and location, electrically isolated?
- Have all the necessary steps been taken to ensure that the work may be carried out in a safe manner?

### 2. Hot Work Permit

A hot work permit is required for any work to be carried out in restricted or hazardous areas as specified, involving the use of a local source of ignition capable of igniting flammable gasses, liquid or any other materials. Example are welding, burning, grinding, blasting, soldering, any open fire work, use of certain non-flame proof equipment, petrol driven vehicles or plant and over speed devices are fitted, opening up of electrical equipment in gaseous areas, etc.

#### Notes for Guidance:

Before authorizing the issue of a **Hot Work Permit**, factors such as the following must be taken into account:

1. Emptying and cleaning of the equipment of flammable material.
2. Isolating from source of hydrocarbon by means of disconnection, blanking, insertion.

3. Sealing off sewers and drains within a radius of 15 meters.
4. Clearing away any flammable material in the work area.
5. Location and earthing of welding or other equipment being used.
6. Degree of risk and potential sites of accidental release of hydrocarbons in the area.
7. Provision of fire fighting facilities and the need for standby fire attendant, if necessary.
7. Testing by means of combustible gas indicator to ensure gas free condition of the equipment and surrounding area.
8. Frequency of repeating gas free listing or the need for the use of portable continuous gas meter with visual and audible alarm.
9. Containing and extinguishing weld sparks and molten slag.
10. The presence of substances such as lube oil and bitumen may give off vapors when heated.
11. Other consideration may be necessary in relation to work and conditions involved.

### **3. Excavation Permit**

An excavation permit is required for all excavations regardless of the depth:

12. The excavation permit is to be issued and signed by the appropriate Engineer or Supervisor and must be countersigned by a designated Electrical Engineer stating that the work will not cause damage to underground services.
13. Where only hand tools are used, a cold work permit is required in addition.
14. For excavation using powered plant, a hot work permit is required in addition.
15. For excavations below 1,200mm, an entry permit is required and in some circumstances, gas-free certificate is required.

### **4. Entry Permit in Confined Space**

An entry permit is required for the protection of personnel entering vessels, tanks, furnaces, pits, sewers, and other confined spaces. The protection is required against such hazards as oxygen deficiency, toxic and flammable materials, power-driven equipment, falling masonry, etc.

The entry permit allows only authorization for entry, work within the vessel will require additional permits in conjunction with the entry permit (e.g. Hot Work, Cold Work, Excavation, Electrical, etc.)

### **5. Electrical Permit**

An electrical permit is required before any work commences on high voltage electrical equipment. The permit must be issued and signed by properly qualified



authorized personnel who must satisfy himself that the equipment in question has been made safe for the work to be carried out on it. Details of isolation requirements will be written on the permit.

Qualified personnel are to be in-charge of the work group and must be in possession of the permit while carrying out the work. He must also witness and check the isolation requirements indicated on the permit.

Work on electrical equipment is to be carried out in accordance with Local Safety Rules – oxygen electrical power system and high pressure apparatus.

A clearance certificate (electrical) is to be issued upon completion of the work by the person responsible for carrying out the work and who was in-charge of the actual work force before the equipment is made alive. He must issue the clearance certificate only after earthing safety devices have been removed, all personnel are clear of the equipment to be returned to a live condition.

### **36. ROAD DIVERSION / DETOURS:**

1. In order to cut a road by excavator for laying pipes diversions are made for traffic movement.
2. The diversion must be smooth and of the same width as of the road say not less than 11 meters.
3. A temporary diversion road is constructed by gatch, water and compaction:  
“Road ahead closed” sign board is placed 500 meters ahead “Diversion” sign board “Men Working” sign board, “Slow Down” sign boards are placed at intervals of 100 meters and “Road Closed” at the closed section.
4. Then empty barrels or Deflective drums, flashers, warning tapes and direction arrows are placed on the diversion for guiding traffics with proper illumination and flashing arrows.
5. Then Kuwait Traffic department inspects the diversion and detour and after getting their approval the road is closed and diversion opened for vehicular traffic.
6. An excavation notification, hot & cold permit are procured before starting the job.

### **37. HEALTH HAZARDS RECOGNITION, EVALUATION & RECTIFICATION**

#### **1. OBJECTIVE**

These documents will make workmen recognize health hazards at site and to adopt ways & control measures to minimize the impact on health.

#### **2. SCOPE**

In all contracts awarded to the Company in hazardous area or potential hazards due to exposure.

#### **3. RESPONSIBILITY**

It is the concern of management as well as all workmen assigned with work.

**Health:**

It is a primary concern for the management of [Al-Hamra Kuwait Co](#) to look after the health of its employee. It will not only look after the safe working condition and practices employed in execution of work but also adopt means and method to control and overcome potential hazards of exposure e.g.

Respiratory exposure to toxic substances:

- a. Existence of temperature extremes
- b. Exposure to nuisance resulting in work stress noise, lighting and sanitation.

In order to overcome and control the potential hazards of exposure we will first recognize it, and then evaluate it and lastly all possible means for its prevention and control will be adopted.

**1. Recognition of Hazards Due to Exposure:**

The study of occupational hygiene in the field of petroleum industries has given us a fair knowledge of health exposure. Unlike safety hazards, health exposures are sometimes difficult to recognize as illness, as it may take time to expose. But by the theoretical concepts the workman are alerted of the possible dangers apparent due to dust, fumes, gases, odors, irritant materials, noise environmental heat and cold variations causing health stresses. Through investigation and continuous monitoring workmen are informed of the hazards and to the extent of exposure and safety requirements.

**2. Evaluation Rectification and Control of Health Hazards:**

There are certain good working practices which when taken under consideration may rectify and control these health exposure e.g.

Hazards	Controls
Dust	Source is identified controlled by wet down or moving work man or using dust recuperator.
Welding Fumes	Can be controlled by proper ventilation and providing suitable exhausts.
Engine Fumes	Engine and equipments such as generator set can be located in open air.
Noise	From high intensity noise in plant or due to equipments. Ear plugs will be provided

Chemical & Solvent	The toxicity of chemicals their handling & storage should be let known to workmen.
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If any consultation with a health professional if ever needed to evaluate a particular hazard the company will provide one.

### 38. **PROPER ILLUMINATION OF WORK SITE:**

It is seen that illumination at work site has become cause of accident, the factors contributing may be direct glaze, reflected glaze, dark shadows and excessive visual fatigue, sometimes delayed eye adoption especially when coming from bright light to dark may cause accident. So factors governing good illumination must always be followed which are as follows:

#### a) **Quantity of Illumination:**

The recommended quantity of light depends on the nature of job to be performed.

16. The degree of accuracy required.
17. The fineness of details to be observed
18. The color and reflectance of the work.
19. The immediate back drop

#### b) **Quality of Illumination:**

The color of light, brightness, its direction, diffusion and degree of uniformity and glaze are also important factors.

#### c) **Visual Display Units and Lighting:**

Sometimes, visual fatigue leading to soreness, irritation, reduces of eyes and also stress is common in persons working on computer and procession instruments. So proper lighting and training will be provided to such persons.

#### d) **Protective Eye Devices:**

As eye is an vulnerable area, eye protection is must for workmen. Company will provide all protective devices like goggles, full-face mark which is needed for different type of jobs. e.g. Welding and grounding, sandblasting etc.

### 39. **NOISE EXPOSURE:**

There are certain levels of noise to which a workmen be allowed to work exceeding which ear plugs or control strategies are adopted to control, isolate or reduce the time of exposure. There is a permissible limit of exposure to noise in the following table, which is worked out by experts of occupational health diseases. We will strictly adhere to this information and instruct, provide training and devices to our workers. Earmuffs and plugs are provided.

### PERMISSIBLE EXPOSURE LIMIT TO NOISE

Duration / Day Hours	Level of Sound in DBA
8	90
4	92
3	96
2	97
1	100
1 to 0.5	105
½	110
¼	115

#### 40 **VIBRATION:**

Vibration is also a cause of stress to human body. Vibration with frequency range 1 – 80 Hz is most sensitive workmen working on machines having high frequency of vibration are provided with safety equipments.

#### 41. **HEAT AND COLD:**

Excessive heat and cold in the working environment may be cause stress on the health of workmen. The company will take all care in providing suitable protective clothing's and adjusting working hours. So that minimum exposure to workmen is faced due to climatic conditions.

#### 42. **MATERIAL HANDLING:**

It is a fundamental activity in all work situations the handling system and range varies very much and may be cause of strains, backache, bruises and even fractures which are suffering to workmen and may cause loss of work hours. For this reason companies provides training, safety appliances and information relating to weight of a load, heaviest side of any load and other handling techniques.

#### 43. **RISK EVALUATION:**

It is an important aspect of work and our management is committed to eliminate or to reduce any risk, which can effect health and safety of workmen or pollute the environment. This is possible only through deep involvement and consciousness of every individual of the Company. The process involved includes the following:

1. Recognition of the possible Hazards to health plant and Environment.
2. Evaluation of the Hazards.
3. Prevention and control of Hazards.

##### **Recognition of the Hazards:**

The source of Hazards may be due to two reasons.

##### **By Human Activities:**

- ♦ Falling of any structure.
- ♦ Tripping over obstacles.
- ♦ Impact by falling objects.
- ♦ Contact with moving parts of equipments.

##### **By Process:**

- ♦ Fire or explosion due to emission of flammable materials.
- ♦ Emission of toxic or corrosive materials.
- ♦ Discharge of fluid from system (hot of cold).
- ♦ Blasting of equipments due to rupture.
- ♦ Risk of Asphyxiation due to poisonous gases of oxygen deficiency.

##### **Evaluation of Hazards:**

This is done to collect information regarding efficient control measures and exposure of workmen to the Hazards.

The risk due to hazards generated by human activities will be controlled by periodical inspection of work at site and training to workmen through safe working practices, maintenance etc.

The hazards generated due to process will be evaluated in two ways:

**Exposure assessment:**

- ♦ By assessing workers exposure
- ♦ By follow up monitoring / surveillance.

**Control measures:**

- ♦ Identification of source.
- ♦ The path of propagation.
- ♦ Spotting of critical points in a system.
- ♦ Comparing different control intervention.

**Prevention of Hazards and its Control:**

As we have recognized and evaluated the hazards we will take preventive action to intercept the hazards. The control measures can be as follows:

- ♦ Engineering controls.
- ♦ Work practices.
- ♦ Personal measures.

Work practices and personal measures will be achieved by following procedures adopted.

- ♦ Position of worker with relation to exposure.
- ♦ By placing protective barriers at entry point for harmful agents.
- ♦ Use of personal protective devices
- ♦ Education and training in personal hygiene and limiting exposure time
- ♦ Good house keeping, adequate storage, labeling, using warning signs etc.

**44. OCCUPATIONAL HEALTH AND DISEASES:**

- a) [Al-Hamra Kuwait Co.](#) will ensure that healthy persons are employed who are not suffering from any diseases, which can endanger illness to other employees.
- b) It will be ascertained through surveillance whether a particular job may be in any way risky to personal involved.
- c) Any work which may be hazardous to health to a person exposed to it may be carefully looked into and proper training, equipments, clothing and remedial action will be taken to protect the person.
- d) The advice and consultation of an occupational health practitioner will be taken at times to design and plan a safe working system with reference to environmental stresses.

45.

### **OCCUPATIONAL HYGIENE AND ENVIRONMENTAL CONTROL**

1. All pollution control methods to the working environment will be adopted for safe working and minimizing risk to the health of its employee and to persons in the receiving who may affect.
2. Any kind of emission either from land, water, and drainage system at the site will be taken by the company and effective measures will be adopted to control it.
3. The construction of amenity area like sanitation working facilities, drinking water will be provided as and occupational health practice.
4. The employees will be educated to keep the amenities extended to them maintenance in a hygienic manner.

### **Provision and Requirement for Food Premises & Food Safety**

1. A food premises will be provided at each site office care will be taken that the material of construction does not contaminate foods.
2. The premises and utensils meant to store or prepare food items will be kept clean and hygienic.
3. The premises will have adequate lighting arrangement.
4. Any inconsumable food or waste will be immediately dumped in berries located outside the premises.
5. Adequate clean and hygienic drinking water will be provided for employees.
6. There will be provision for sufficient number of basin for washing hands and employees will be asked to keep it clean and not to soil it.
7. Enough quantity of soap and detergents will be supplied by the company for its employee.

### **46. HEALTH AWARENESS EDUCATION**

1. All employees during orientation program and also during counseling will be educated with the fundamental principles of healthy living.
2. The employees will be made aware of the pollution and hazards t work site, their harmful effects and will be guided with measures & techniques which can cause the least impact on their health
3. Every employee will be given training in first aid.



## **Disposal of Waste and Garbage**

All waste and garbage arising during the course of work at site and workshop, whatever quantity, will be collected in closed containers located at our site office / work areas, and will be transported through trucks to designated area located at **Shuaiba** Waste Facilities and Municipal dumping location at Sulaibiya. We will take all precaution that waste and garbage are properly handled and may not be a cause of nuisance and pollution with a pledge to keep Kuwait clean. We will have our waste and garbage disposal subcontractor.

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