AZAMOSA

HEALTH, SAFETY AND ENVIRONMENT

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1. INTRODUCTION

1.1. The Project Management Team (PMT) and Operations Unit of Azamosa recognizes the importance of the planning Health, Safety & Environment (HSE) into the project/tasks at the earlier possible stage; if the injuries and health arising from the project are to be avoided. To this end, this HSE Policy/Plan document has been prepared to describe how the project and operations units intends to manage, control and co-ordinate the works in order to assure the HSE and welfare of all personnel engaged on any project/task and others who may be affected by the operations.

1.2. HSE is an integral part of our business and we will manage it in the same manner as any other business objective.

1.3. For our HSE Plan to be effective. It is essential that the management and the supervisory staff of The PMT and its' sub-contractors are familiar with and implement and the relevant requirements of the plan. All PMT management and supervisory personnel will there be provided with a controlled copy of the plan as will the senior resident project representative of each contractor.

1.4. The PMT will actively seek the support of all operatives engaged on the project to look after the HSE of themselves and their colleagues by working within the spirit of the HSE Plan.

1.5. Any person found to be disregarding the requirements of the plan would be subject to the disciplinary action, which may result in their dismissal from the project/job.

2. HSE POLICY, TARGETS & STRATEGY

Project HSE Objectives

The PMT is committed to accomplish its duties and responsibility for the project using the available resources to achieve outstanding performance in completing the work and attaining the following Project HSE objective:

- Complete the project with distinguished HSE record
- Reduce risk to personnel, natural environment, business performance and reputation to levels as low as reasonably practicable
- Meet all our environment commitment
- Manage integrity and risk in all aspects of design, construction, transportation, installation, and operations using criteria compatible with statutory requirements

2.1 HSE Strategy

The following set out the HSE Strategy, achievement of which will ensure compliance with the Project's HSE Policy and state objectives.

2.1.1. Identify and implement the requirements of HSE contained within acts, regulations, and codes of practice.

2.1.2. Ensure compliance with appropriate national and international regulations, local rules, regulations, and code of practice.

2.1.3. Establish and maintain communication with government agencies, local authorities and unions on all matters relating to HSE.

2.1.4. Ensure that appropriate safety system is applied throughout the project and vendors and fabricators have met their contractual and statutory HSE requirements.

2.1.5. Ensure that sufficient and appropriate documentation is supplied to permit development of maintenance program for construction equipment.

2.1.6. Encourage positive involvement of all staff to promote HSE awareness by:

a) Thorough investigation of all accidents and incidents inclusive Lost Time incidents. First Aid Case and Near Miss Case so as to identify the causes and initiate preventive measures in preventing reoccurrence.

b) Convene regular safety meetings throughout the execution of our projects and tasks execution timelines.

c) Conduct regular HSE inspection.

2.4.7. Ensure that HSE training is carried out in accordance to the needs of individuals and the work on hands.

Our Projects shall:

- Create awareness and promote engagement on all HSE aspects from all team members
- Maintain highest level of ethical and professional standard during project execution
- Create a healthy and safe working environment for all project participants

It is the PMT policy to consider promotion of HSE as being the line responsibility and an integral part of duties of all managers and supervisory staff.

All personnel involved in the project have the duty to conform to the PMT policy and procedures.

The head of the PMT has the overall responsibility for HSE.

The top management of the Contractor supports fully this policy and encourages all employees to pro-active approach with respect to HSE matters in executing their duties.

2.2 Health and Safety Policy & Objective

Health and Safety Policy

The Project Management Team/Operations Department/Contractors in all cases shall provide and maintain a Healthy and Safe working environment in compliance with good business practices and legislative requirements.

Safety and Health Objectives

We shall achieve our Health and Safety Policy through the following objectives:

- Instill and promote Health & Safety consciousness amongst employees and subcontractors to prevent accidents and injuries and provide a healthy workspace with high hygiene standard
- Conduct effective Health and Safety training.
- Provide availability of adequate medical treatment for all personnel involved in the Project and establish efficient medical evacuation procedure.
- Implement innovative measures to continuously improve our safety practices.
- Provide the best possible care in design, construction and maintenance of equipment and facilities.
- To observe the national health & safety and regulations and other international standard regulations.

2.3. Environmental Policy & Objectives

Environmental Policy

We shall conduct all our operations in such a manner that there will not be any contravention of the applicable environmental laws and regulations.

Environmental Objectives

We shall achieve our Environmental Policy through the following objectives:

- Minimize the generation of hazardous waste and handle all waste in an environmentally sound manner.
- Prevent releases; spills and leaks take immediate containment measure in the event of accidental discharges.
- Restore the environment on work accomplishment in compliance with enforced statutory requirements and according to contractual commitment.
- Encourage recycling and re-use of materials
- To observe the national Environmental regulations and other international standard regulations.

3. ORGANIZATION FOR HSE

This part of the document describes PMT organizational structure for HSE and outlines the duties and responsibilities of the key personnel who have significant contributions to make in the successful implementation of our HSE Plan.

3.1. *Duties and Responsibilities*

3.1.1. Project/Operations Director

Has overall responsibility for all HSE matters on a project/task:

a) He is responsible to the top management for ensuring that the HSE Plan is regularly reviewed, kept up to date and implemented.

b) He will ensure that all line management staff of the PMT are conversant with the relevant requirements of current local legislation and the HSE Plan and are assigned appropriate duties and responsibilities to assist in its effective implementation.

c) He will arrange for the HSE performance of all subcontractors to be continuously monitored.

3.1.2. HSE Manager

Accountable to the Project/Operations Manager for supervising and monitoring the overall implementation of the HSE Plan. In particular his duties will include:

a) The regular review of the Project HSE Plan to ensure that it remains comprehensive, effective, up to date and reflects the prevailing requirements of the project. Where there has been significant change in the organizational structure. Hazards or arrangements for HSE on the project/task requiring amendment or adjustment of the plan, he will report this to the Project/Operations Manager accordingly.

b) The provisions of a comprehensive HSE advisory service to the Senior Project/Operations Manager, relevant members of the PMT and where appropriate, representatives of subcontractors on the project/task.

c) The establishment and maintenance of HSE inspections procedures, including the preparation and appropriate distribution of written reports detailing defects, weaknesses and recommendations for improvements.

d) The establishment and maintenance of adequate procedures to ensure that all accidents and dangerous occurrences are thoroughly investigated and promptly reported to in appropriate parties.

e) The maintenance of comprehensive accident and dangerous occurrence statistics for the project.

f) Liaison with client representative, relevant enforcement authorities, sub-contractor's safety personnel and other relevant panics on HSE matters.

g) The submission of monthly written reports to the Project/Operations Manager in accordance to the stipulated format.

3.1.3. Site Manager/Operations Supervisor

Accountable to the Project/Operations Director for implementing the pertinent requirements of the HSE Plan on the operations for which they are responsible. In particular this will require them to:

a) Be familiar with the requirements of the relevant HSE legislation and the HSE Plan.

b) Monitor to ensure that the operations under their control are conducted in accordance with the requirements and take urgent and appropriate action to prevent unsafe working practices or other infringements of statutory or HSE Plan requirements. Liaison and co-operate with the Safety Officer and ensure that any defects brought to his attention are promptly remedied.

d) Establish and maintain clear lines of communication on HSE matters with the relevant Client representatives and subcontractors under their control.

e) Under the direction of the Project/Operations Manager attend and Participate in Project HSE Meetings.

f) Provide adequate instruction and supervision to personnel under his control and encourage them to report defects or other problems that may adversely affect HSE.

h) Set an example.

3.1.4. Engineers and Other Expatriate Staff

Accountable to the Project/Operations Manager, through the respective Site manager/Operations Supervisor, for assisting them in the implementation of the pertinent requirements of the HSE Plan on the operations for which they are responsible. In particular this will require them to full fill the duties assigned to them in the following paragraphs.

a) Be familiar with the requirements of the relevant HSE legislation.

b) Monitor to ensure that the operations under their supervision are conducted in accordance with the requirements and take urgent and appropriate actions to prevent otherwise.

c) Unsafe working practices or other infringements of the foregoing.

d) Liaison and co-operate with the HSE manager and ensure that: any defects brought to their attention are promptly remedied.

e) Establish and maintain clear lines of communication on HSE with the relevant Client representative and subcontractors under their supervision.

f) Under the direction of the Project/Operations Manager, attend and participate in HSE Meetings.

g) Provide adequate instruction and supervision for personnel under their supervision/leadership, and encourage them to report defects or other problems that may adversely affect their health or safety.

h) Set a personal example.

3.1.5. All Personnel

Every person employed on the job has a statutory duty to take reasonable care for their health and safety of themselves and others who may be affected by their actions or omissions at work.

a) With regard to the statutory duties imposed on their employer, they must cooperate with their employer to enable him to comply with the relevant statutory requirements.

b) No person shall intentionally or recklessly interfere with or misuse anything provided for HSE under the relevant statutory provisions.

c) All personnel shall wear or use the appropriate safety equipment or clothing and use the appropriate safety devices

d) All personnel will familiarize themselves with the relevant requirements of the HSE Plan.

e) All personnel will report any accidents and damage to property or equipment to their immediate supervisor, irrespective of whether persons are injured.

f) All personnel are encouraged to make suggestions to improve HSE to their supervisor and the HSE manager.

4. ARRANGEMENTS FOR IMPLEMENTING THE PROJECT HSE PLAN

This section of the document describes the PMT arrangements for eliminating or controlling the associated risks, thereby satisfying both its' statutory aid contractual obligations and promoting acceptable standards of HSE throughout its operations.

All sub-contractors engaged in the project/task will conform to the arrangements described and co-operate with its accident prevention program.

4.1 Statutory & Contractual Obligations

4.1.1. The PMT recognizes its responsibility to comply with all relevant local statutory HSE requirements and will ensure that all involve in its operations observe such requirements accordingly.

The PMT has established and maintained a range of HSE management techniques designed to ensure compliance such as preparation of HSE plans, permit to work system, job safety analysis HSE inspections, HSE audits, regular HSE meetings. Written safe working procedures and adequate communication systems.

4.1.2. Contractual Obligations

The PMT recognizes its contractual obligations is to ensure that the ongoing HSE of all concerned who might be affected by its' operations, during the execution of the works is noted.

The HSE Plan is prepared to describe how the PMT intends to satisfy these obligations and to manage and co-ordinate its' operations and the operations of its sub-contractors accordingly. Every sub-contractor will cooperate with the project team on all relevant HSE matters to enable PMT to meet its' contractual obligations.

4.1.3. Foreseeable Hazards of The Project/Task

The foreseeable hazards associated with various operations with any project/task can be summarized as follows:

- Work at height and the associated risks of fall of persons or objects

- Work in confined spaces.
- The use of plant and equipment, including lining appliances machines, Generators, etc
- Rigging and handling wire ropes.
- Handling use, storage, and transportation of materials and substances.
- Powdered Hand Tools operations.
- Use of explosives powdered tool.
- NDT Test.
- Exposure to environmental or health risks associated with dusts, fumes, vapors, etc.
- Exposure to excessive noise levels.
- Pressure Testing.
- Spray Painting and Blowing.
- Heavy Lifting.
- Energizing/De-energizing of Electrical System.
- Excavation
- Hazards in Driving

4.1.4. The foregoing list identifies the major areas of concern which it is necessary to control or guard against by implementing safe places, permit to work system, adequate monitoring and control arrangements and the provision and use of suitable protective clothing and equipment.

Safe work practice of the foregoing hazards can be found in the Safe Work Practices Manual. The following paragraphs describe the PMT

arrangements for ensuring that the risks arising from the foregoing hazardous activities are eliminated or adequately controlled.

4.1.5. Risk Assessment As an integral part of the project accident prevention program PMT will implement arrangements to ensure that all construction activities are subject to a format assessment of risk prior to the commencement of individual operations. The respective contractors will carry out the risk assessments and the results monitored by the Project HSE manager.

4.2. Group Meetings

Regularly scheduled meetings on HSE are an essential element in HSE Management. The following meeting will be held :

- Daily tool box meeting
- Accident investigation meeting
- Weekly progress meeting
- Sub-contractors' site managers meeting
- SHE committee meeting

List of the attendees for each meeting will be submitted later as required in the proper reporting standards of operations.

4.3. Hazard Identification and HSE Audit and Inspections

Unsafe conditions are continuously being made by the work of people tools and equipment. It is important that remedial action is taken to revert such conditions without delay. Proper training and enforcement of the HSE regulations will greatly reduce the number of unsafe conditions, However, due to wear and tear of the tools and equipment and action of men, it is important that hazard identification and safety inspections are carried out on a regular basis.

4.3.1. Objectives

a) Identify potential problems that were not anticipated during design or task analysis.

b) Identify equipment deficiencies, particularly problems of wear, abuse or misuse.

c) Identify substandard work practices.

d) Complement preventive maintenance program

e) Identify the effect of changes in process or materials.

f) Demonstrate Management commitment to HSE.

4.3.2. Hazard Identification

All project personnel will be encouraged at all times to identify and correct hazards as part of their normal duties whenever possible.

Any hazard identified, which is outside their ability or cannot be rectified immediately is to be made safe with appropriate measures such as barricades, warning signs, etc. and such condition are brought to the attention of the Supervisor concerned immediately.

Identified hazard brought to the Supervisor's attention, which cannot be rectified, will be recorded and follow-up action investigated by the Supervisor.

4.3.3. Types of Inspections

a) Daily HSE Inspection by HSE Personnel

The HSE manager assigned to the project arrange for daily HSE inspection. The report will be handed to the Supervisor in-charge who will acknowledge receipt by signing on the inspection report. A deadline will then set for follow-up inspection.

b) Project Management Team Inspection

The project management team led by Senior Project/Operations Manager or his deputy accompanied by HSE manager will carry out joint inspection to see that the HSE standards set for the project are up to the expectation. Such inspection is generally carried out before the weekly progress meeting.

4.4. HSE Information & Training

The PMT recognize that the provision of adequate HSE information and training for all level of personnel makes a vital contribution towards and effective accident prevention program and will therefore ensure that suitably structured schedule of information and training is adopted by all parties throughout the duration of the project.

4.4.1. HSE Information

a) PMT will adopt a variety of techniques such as displaying of posters, distribution of HSE information sheets, newsletters and bulletins in order to generally promote the HSE of the project.

b) PMT will also prominently display at the site entrance an accident statistics board showing the safety performance of the project.

4.4.2. HSE Training

The PMT will ensure that each employee working on the project received adequate training to enable them to perform their work function/tasks in a safe and efficient manner. All new employees inclusive of those from sub-contractors will be given Induction Training prior to being placed on the job.

All visitors to the project/operations site shall attend a site safety briefing prior to visiting the site. The Safety Officer is responsible for the development of the training matrix. The training matrixes spelt out training

need for the individual work function and task all training courses, together with records of personnel attendance, will be properly documented. These records shall be maintained on file and readily for inspection as and when required.

General HSE Training will include as a minimum

Personal	Type of Training
PMT Members	HSE Plan
All Workers	Induction making them to follow all the requirement of the plan
Selected Personnel	Fire Fighting, First Aid, BA, Rescue
Visitor	HSE Briefing

4.5. Permit to Work System

Many hazards are recognizable and can be overcome by physically separating people from them, e.g. by using effective guarding on machinery.

Permit to Work System is needed when **Hazards** cannot be physically eliminated and some element of risk remains. Under such circumstances formal procedures which results from systematic examination of a task in order to identify all the hazards. It defines safe methods to ensure that **Hazards** are eliminated or risks minimized.

4.5.1. Objectives of Permit to Work System

a) Ensure that such work can be carried out with due regard to the health, safety, environmental and welfare of the workers.

b) Prevent any incompatible work from being carried out at the same time in any location of the project/task, and

c) Ensure that the necessary safety precautions are taken and enforced when such work is being carried out.

4.5.2. Type of Work Which a Permit-To-Work System Apply

For this project works that need permits prior to commencement are listed below but not limited to:

a) Any hot-work, regardless whether carried out in a confined space or otherwise.

b) Any work which involves the use of any hazardous, volatile, corrosive, or flammable chemical, material, or solvent.

c) Any work involving entry into any confined space.

d) Spray painting operation.

e) Any grit-blasting work carried out on site

f) Any repair maintenance or testing work carried out on the hydraulic system.

g) Any energizing / de-energizing of electrical system for the commissioning or testing of electrical and mechanical system.

h) Any pressurizing of pipe/ vessel on the project/task or filling of gas or liquid into the system.

i) Radiography operation

j) Any excavating Work

j) Any other hazardous work as decided by HSE Personnel or Project/Operations Manager.

4.6. Craft Certification & Training

Due to the lack of previous experience within the indigenous workforce,

the PMT shall implement a Craft Certification and Training Program. The Intent of this program is to ensure Craft personnel have the requisite skill and competencies to meet the demanding requirements of the project/task.

4.6.1. Responsible Person/Appointed Persons

A responsible/ Appointed Person is an employee who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous or dangerous to employees or environmental and who has authorization to take prompt corrective measures to eliminate them.

The Responsible/Appointed Person must have an immediate knowledge of the subject, either by years of experience in the specific field, formal education or specialized training pertaining to:

a) Job and/ or activity being performed

b) Operation and use of specific equipment.

c) Potential hazards associated with the specific job.

d) Safety and health standard.

The Site manager along with the HSE manager designates the Responsible/ Appointed Person(s). An evaluation of the person is made based on his knowledge. Formal training or job experience in the particular area designated. The Site manager documents the designation of a responsible/Appointed Person on the appropriate form. The form is too precise as to include all duties expected of the person. This form is to be maintained in the PMT office and readily for inspection as and when required.

The Responsible/Appointed Person is responsible for complying with the required operation, inspection, testing- repair of equipment and machinery as prescribed in the competent person form.

Responsible/Appointed Persons are required but not limited to the following:

- Operators of all types of crane, forklift and lifting machines, electricians
- Persons to erect and inspect scaffolds
- Persons of operational power, actuated tools and fastener, riggers, etc
- Abrasive Blasting

4.7. Job Safety Analysis (JSA)

Purpose

The purpose of job Safety Analysis is to provide a systematic and documented method of identifying hazards, Selecting control measures and establishing healthy, safe and environmentally responsible methods.

Scope

The requirements set out herein apply to all the project sites and the areas controlled and managed by Site HSE manager

JSA Methodology

4.7.1. Guide for Selection of Task to Be Analyzed

- Hazard Potential. Some tasks have a recognizable hazard potential greater than activities generally conducted at the

site/workplace. For example dual cranes lift, spray painting within close vicinity of hot-work, etc.

- Consequence of Failure. A work method failure during the execution of some tasks may result in unacceptably damaging consequences. For instance pressure pneumatic testing of pipelines.
- Accident History. Any task associated with a poor accident record.
- Changed Work Methods. Repetitive tasks, which are the subject proposed, changed to the work method/ procedures.

In Contractor Division context JSA shall be conducted but not limited to the following tasks:

- Dual or multiple cranes lift
- Module stack-up Module weighting
- Hydrostatic and pneumatic pressure testing
- Sensitive leak test
- High-tension cable/equipment testing/commissioning
- Module load-out
- Any crane lift exceeding 75% of the crane capacity

4.7.2. JSA Procedures

- At the planning stage the project in-charge with the assistance of the HSE personnel identifies the critical tasks to be analyzed
- A team leader will then be appointed for each task to be analyzed. He must be technically competent and thoroughly familiar about the task.

- Other members in the JSA team include the HSE personnel for the project/task, supervisor and others who involve in the task at times, client representative will also be invited to join in.
- At the JSA meeting, the tasks are divided into a series of logical steps and listed in their normal order of occurrence.
- Each logical step is then thoroughly reviewed and all potential hazards associated with the step will be identified. In doing so the JSA team should consider

  Personnel involved

  Equipment involved

  Effect of Movement of personnel or equipment on Environment effects
- Air, water, or soil contamination
- Having identified the potential hazards, action to be taken will then map out for implementation. Generally, action will be formulated along the following guides.

  Substitution where **Hazardous** materials have been identified as a hazard then the preferred option is to replace the material with a less hazardous one.

  Engineering, The removal of the potential hazards by engineering the job is a preferred option. This, for example may involve such action as re-designing pipe-work/equipment or configuring a crane.

  Ventilation, Natural or forced ventilation may be used to control airborne hazards.

  Administrative Control: The application of administrative

control to hazards may include such actions as limiting the time of exposure, rotating of personnel, restricting unauthorized entry, etc.

Personal Protective Equipment: The provision of appropriate PPE does not eliminate the hazards, but only shields those exposed to it. such action will have to be coupled with training in the correct use of the equipment.

- The detailed JSA is then recorded in a form and distributed to all concerned.
- Front line supervisor shall use the form as a briefing note while carrying out pre-job briefing to all involved in the task.

4.8. Safety Code of Conduct

It is the duty of even employee inclusive of sub-contractor employee to comply with the Company HSE Rules and Regulations. The Company has the ultimate right to impose disciplinary action inclusive of monetary penalty on noncompliance.

General

- All Supervisors are to report unsafe acts and report offenders.
- HSE personnel and Members of the PMT are empowered to book direct and subcontractor's employees for non-compliance of the HSE Rules and Regulations.
- Any fine imposed on sub-contractor's employees shall be charged to their employers.

- Any employee who is aggrieved by the decision on any safety offence committed can appeal to the Project HSE Committee or the Legal & Security Department, whose decision shall be final.

Details of the penalties can be found in the HSE Management Manual.

4.9. Personal Protective Clothing & Equipment

Personal Protective Clothing and Equipment are not substitutes for effective engineering control, safe working condition or sound work practices, but are provided to play an essential part in the protection of the workers. Its' usage do not eliminate the hazards but is aid to controlling individuals exposure to prevent/minimize injury or adverse health effects.

4.9.1 Project/Operations Team

All PPE will be issued to direct employees on need basis and Sub-contractor is responsible to provide the necessary PPE to all its' workers.

It is the responsibility of all individuals to take care of their issued PPE from damage. All damaged equipment must be forthwith reported to the immediate supervisor concerned.

All PPE used shall be of approved types and no modification shall be made to the equipment.

4.9.2 Types of PPE & Its Application

a) Head Protection

Safety helmets must be worn in operational worksite at all times for protection against head injuries. Painted / metal helmets are not allowed to be used.

b) Eye & Face Protection

Approved eye or face protective equipment such as goggles and face shield must be worn when carrying out the following task.

Welding helmets and hand shield fitted with special type filter lenses for arc welding.

- Cup type goggles for any welding or cutting other than arc welding.
- Safety spectacles for machinist, chippers, stonemasons, etc.
- Plastic and non-flammable collapsible goggles for dusty atmosphere.
- Face shield for grinding / chemical handling operations.
- All personnel while entering working area shall wear safety glasses.

c) Body Protection

- Overalls or long trousers or shirts must be worn
- Rubber aprons for protection against acid & chemical splashes.
- Leather aprons must be worn when handling molten metal or shielding against a heat source.
- Overalls should be worn at all time; loose clothing should not be permitted at worksite.
- Arm protectors should be worn to prevent bums during arc welding and other operations.

d) Hearing Protection

There are basically two types of ear protective equipment - ear muffs and ear plugs. These have to be worn when working

in areas where there are excessive noises (above 85 db) and also in the vicinity where following process take place

- Pneumatic tripping
- Arc gouging
- Grinding
- Grit blasting
- Beside generations and air compressor sets or equipment and etc.
- All FAS SHOPS (1.2,3 New Bay, Boat House & Blasting Chamber) are classified as noisy area, wearing of hearing protector is compulsory at all time.

e) Foot & Leg Protection

- Employees must wear safety shoes when working
- Foot cover must be worn if there is danger of sparks or molten metal falling into the shoes.
- Rubber safety boots could be worn in muddy areas.
- Non-conductive safety footwear is required in conjunction with the works carried out by electrician.

f) Respiratory Protection

- Appropriate respirators should be worn when in contaminated atmosphere of gas, fumes, or vapors.
- Approved type of air supply respirator must be worn when toxic gases are found or when painting in confined spaces. When airline mask is used and air is supplied from a compressor, measure shall be taken to ensure that oil, carbon dioxide,

carbon monoxide, and other contaminants are within the permissible limit.

- Air supplied blasting helmets are to be used during grit blasting.
- Self-supplied respirator must be used if the atmosphere is contaminated with highly toxic vapor situation and for rescue purposes.

g) Safety Gloves

- Leather gloves are used for handling heavy equipment rough material, loading and unloading pipe work, handling wire lines, slings and cables also for welding.
- Cloth gloves afford adequate protection when handling pipe or other relatively smooth surface material.
- Chemical resistant rubber gloves are to be used when handling acids alkalis or other corrosive chemicals.

h) Safety Harness

- Safety Harness must be worn if the worker is liable to fall more than two meters in height when there are no secure hand hold and foot hold, and protective railings are not provided.
- Secure and sufficient anchorage point must be provided not lower than the level the worker is working for the use of safety Harness.

4.10. Emergency & Evacuation Procedures

Project Management/Oprations Team will implement suitable procedures and drills for emergency situations, including rescue operations. The foreseeable emergencies would include, but not limited to fire, person

injured and Chemical Spill. In the event of other potential emergency situations being identified during the execution of the project, specific procedures will be developed by the PMT and appended to the HSE Plan. The following paragraphs describe the common arrangements for emergency procedures:

4.10.1. Emergency Coordinator

a) To ensure that all emergency situations are effectively coordinated PMT will appoint, from amongst its PMT, a Project Emergency Coordinator and deputy. The names of both the Project Emergency Coordinator and his deputy and their contact numbers will be made known to all concern. All concerned are required to alert the Project Emergency Coordinator immediately they become aware of an emergency situation.

b) The Project Emergency Coordinator's responsibility will include ensuring that on-site emergency; rescue and all key personnel have been alerted and summoning the assistance of external emergency services such as fire, ambulance, and police as appropriate. He will also maintain a log of all relevant information for each incident, recording names, actions, dates and times, etc

4.10.2. Emergency Rescue Operation

a) In order to ensure an adequate response to an emergency situation, PMT will ensure that an adequate number of suitably trained personnel are appointed and competent in the use of fire fighting equipment, provision of first aid, etc.

b) PMT will ensure that suitable emergency/rescue teams are established to ensure rapid response to any emergency

situation, the rescue teams will comprise of PMT member and where appropriate, its subcontractors nominated personnel.

c) The emergency rescue team will participate in the simulated emergency exercise organized by the PMT.

4.11. Equipment & Tools Maintenance Procedures Purpose

The purpose of this procedure is to ensure that all equipment, tools used on site by Sub-Contractor are inspected regularly and maintained in good working condition.

4.11.1. Local Requirements

Equipment required the inspection and examination by qualified person under the requirements such as lifting gear, lifting appliances, lifting machine passenger-hoist, boiler, pressure vessel, air receiver etc. shall comply accordingly.

In addition the maintenance and Inspection shall also be carried out monthly and before use in accordance to Contractor safety procedure.

4.11.2. Contractors tools and equipment must be suitable and adequate for the purpose, prior to entry; all these tools must be inspected by the HSE Department.

4.11.3. The Sub-Contractor shall provide suitable storage approved by the HSE Department with suitable racks and bins for storing tools and equipment.

4.11.4. The Sub-Contractor shall nominate or employ the services of a competent qualified technician to inspect and tag electrical and mechanical tool on a monthly basis. The tag shall display name,

signature of the competent person and date of inspection to indicate the tool is safe for use.

The Sub-Contractor shall forward the name and qualification of the competent person to the Senior Project Manager at the commencement of the contract.

4.11.5. The Contractor shall keep, on site, a register of all electrical power tools, lifting equipment, pressure vessel, and vehicle. The register shall detail:

- Serial number of tool/equipment
- Name of competent Inspector
- Date of Inspection
- Approved person inspection date
- Type of tool/equipment-Make/Manufacturer

4.11.6. No power tool, lifting equipment, compressor, and vehicle shall be used unless it is tagged with a valid inspection tag.

4.12. Accident Reporting Procedures Definition

4.12.1. Incident

An incident is an unplanned event or chain of events, which hash or could have caused injury or illness and/or damage (loss) to people, assets, the environment, or reputation.

4.12.2. Injury

An injury is categorized such as cut, fracture, sprain, amputation etc., which results from a single instantaneous exposure.

4.12.3. Lost Time Injuries (LTI's)

Lost time injuries are the sum of Fatalities, Permanent Total Disabilities and Lost Workday Cases but excluding Restricted Work Cases.

4.12.4. Lost Work Day Cases

A Lost Workday Case is any work related Injury which renders the Injured person temporarily unable to perform any Regular Job or Restricted Work on any day after the day on which the injured was received. In this case "any day" includes rest day, weekend day, scheduled holiday, public holiday or subsequent day after ceasing employment.

Note: This definition deviates from OSHA guidance, which considers restricted work as a lost workday case.

A single incident can give rise to several Lost Workday Cases, depending on the number of people injured as a result of that incident.

4.12.5. Medical Treatment Case (MTC)

A Medical Treatment Case is any work-related injury that involves neither Lost Workdays nor Resident Workdays but which requires treatment by, or under the specific order of, a physician or could be considered as being in the province of a physician.

Medical Treatment does not include First Aid even if a Physician or registered professional personnel provide this.

4.12.6. Near Miss

A Near Miss is an incident which potentially could have caused injury or Occupational illness and / or damage (loss) to people, assets, the environment, or reputation, but which did not.

4.12.7. Permanent Disability

Permanent Total Disability is any work-related injury, which permanently incapacitates an employee and results in termination of employment.

4.12.8. Regular Job

A Regular Job is one, which has not been established to accommodate an injured employee. It should be an existing job or task within the Contractor's organization, which the injured is deemed competent to perform.

4.12.9. Restricted Work Case (RWC)

A Restricted Work Case is any work-related injury, which results in a work assignment after the day the incident occurred that does not include all the normal duties of the person's Regular Job. The restricted work assignment must be meaningful and pre-established or a substantial part of a Regular Job.

4.12.10. Reportable Cases are:

- Fatality
- Permanent Total Disability
- Permanent Partial Disability - Lost Workday Case
- Restricted Workday Case
- Medical Treatment Case

4.12.11 Accident Reporting Procedure

- All injuries regardless whether it is a LTI, RWC, LWC, MTC or FAC arising out of work are required to be verbally reported to the immediate Supervisor. If the Supervisor is not available, he shall report to HSE Officer.

- A statement has to be submitted in the form set out the in SF/0-A by the injured to the immediate Supervisor within 24 hours.
- For serious injuries which require the injured to be hospitalized or the injured is unable to write a report, then the Supervisor will interview him and prepare a statement for the injured which cannot be interviewed.
- Supervisor is to verbally notify the HSE Officer immediately and follow up with a report in the form set out in SF10-B within 48 hours to the HSE Department. The submission of Supervisor's investigation report should not be delayed even if the injured statement is not ready.
- No alteration or addition shall without the consent of the HSE Department be made to any machinery, equipment, plant or article which may have contributed to cause an accident or dangerous occurrence.
- The Supervisor shall immediately secure the mishap area and wreckage until released by the HSE Officer, Except for rescue work or work necessary for general safety of life and property.
- HSE Personnel on duty shall immediately call the General Manager, and HSE Committee Chairman (Head of Project Team).
- HSE Department will investigate the accident and submit report to General Manager within 24 hours.

4.12.12. Property Damage Incident / Near Miss

The reporting procedures for property damage incident / near miss are similar to reportable accident as per Section 4.12.11 of this chapter Except that the employee who involves in the incident will make necessary report.

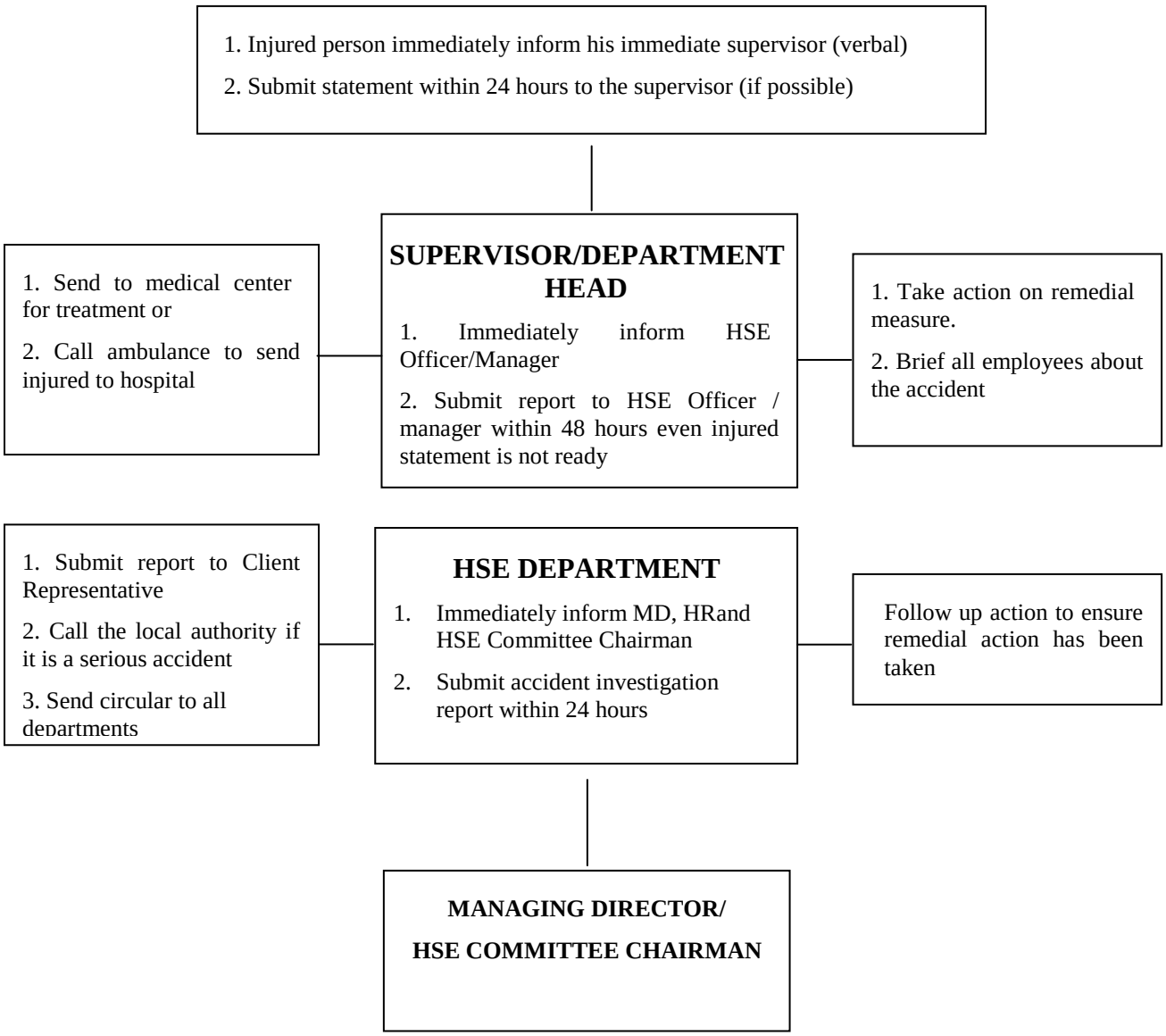
4.12.13. Prevention of Recurrence

Senior Project Manager or his deputy and HSE Officer and Site HSE should discuss and work out preventive measures to prevent recurrence of the accident / incident. Systematic approach will be adopted to identify the root cause rather than the immediate causes.

4.12.14. Follow-Up Action

HSE Officer will monitor and report back on the status and follow-up action to prevent recurrence.

ACCIDENT/DANGEROUS OCCURRENCE/INDUSTRIAL DISEASE REPORT PROCEDURE



4.13. Substance Abuse Policy

Policy

No alcohol or drugs must be taken into any workplace. Staff and workers, inclusive of sub-contractor workers must never be unfit to work through alcohol or drug used. This should be made clear to all staff and workers at the Safety Orientation Course and should include the risk due to heavy drinking at the previous evening.

Any person found in possession of any quantity of alcohol; or drug shall be subject to disciplinary action, which could result in instant dismissal.

Prohibited Substances

Include but not limited to the following:

- Those substances, which are forbidden under the local legislation
- Any alcoholic beverage
- Any solvent or glue or other products used for the purpose of intoxication
- Any prescription drug not being used for its originally intended purpose

4.13.1. Indication of Drug or Alcohol Problem

Irritability, depression, mood/personality changes, decreased ability to cooperate with other workers and reduced or ineffective performance. Though these symptoms could also be caused by other medical or personal problems, but an investigation would still be appropriate

4.13.2. Policy Implementation

All supervisory staff shall maintain strict control over the implementation of this policy.

Whenever Project Team member suspects a breach of this policy whether by their own or by the sub-contractor workers it may conduct an unannounced searches and inspections. In the event that prohibited substances are found, worker involved will be ordered to stop work immediately and case referred to the Senior Project/Operations Manager for necessary action.

If necessary, the suspect may be instructed to perform blood/ urine tests at the Medical Center.

4.14. Environmental Protection

Introduction

This section outlines the likely environmental problems, which may associate with the Project activities, and the measures adapted by Contractor to control and minimize the impact.

4.14.1. Foreseeable Environmental Problem

4.14.2. Dust from Blasting Operation and Paint Vapor from Spray Painting Activity

Appropriate enclosures will be put up around the item needs to be blasted or spray painted so as to minimize amount of airborne particles I vapors dispersed from the work areas. Workers involving in these operations are compulsory to don appropriate of respiratory protections.

4.14.3. Waste Product

All used material either from fabrication process or result from fabrication process shall be defined as waste product.

These waste products shall be categorized in three types. They are:

- Rubbish and scrap
- Liquid waste

- Solid and hazardous waste

4.14.3.1 Rubbish Scrap

Rubbish -All garbage materials from food wastes and containers.

Scrap-All off out from fabrication materials or noncompliance materials to fabrication process (as deem fit by management) and empty oil drum.

4.14.3.2 Liquid Waste

Safety Department has established and listed the following as the liquid waste available in J.V there are:

5. LIFTING APPLIANCES & CRANES OPERATION

5.1. The purpose is to establish a standard guideline for the use of lifting appliance and operation of crane.

5.2. This guideline is applicable to all-lifting appliances and crane(s) which and in operation within the companies project sites.

5.3. Definition

5.3.1. Approved Person any person who is approved by the Chief Inspector of Factories by a certificate in writing for the purpose of carrying out examinations and test of hoist and lifts, lifting gears, or lifting appliances and lifting machines.

5.3.2. Lifting Appliance

Includes a pulley block, grinding-chain blocks or set of chain block.

5.3.3. Lifting Gears

Include chain, ropes, chain strips, rope slings, rings, hooks, shackles, swivels or eyebolts.

5.3.4. Lifting Machines

Include a crane, side boom, run way transporter, Piling frame and any suspended scaffold capable of being raised.

5.4. LIFTING SUPERVISOR

5.4.1. Appointment of Trained Competent Person Qualified Lifting Supervisor who is responsible for all lifting operations of any crane, mobile crane, or tower crane shall be he officially appointed by Project manager.

5.4.2. Duties and Responsibilities of Lifting Supervisor

a) Coordinate all lifting activities.

b) Check the load and riggings to ensure that the load can be lifted and removed safely by any crane, mobile crane or tower crane.

c) Ensure that the ground conditions are safe for any lifting operation to be performed by any crane, mobile crane or tower crane.

d) Ensure that all lifting activities are carried out in accordance with safe and sound practice.

e) Take all necessary measures to rectify any unsatisfactory or unsafe conditions reported to him by the crane operator.

f) For mobile crane operation conduct a check in accordance to checklist.

5.4.3. Training for Lifting Supervisor

Lifting Supervisor should have at least 2 years experience in supervising lifting operation attended and successfully completed the Lifting Supervisor Course conducted by legally authorized certification body.

5.5. Competency of Operator

Any Person below 18 Years of age shall not operate a crane or signal a crane.

5.5.1. Mobile Crane or Tower Crane Operator

The operator should be a person who has successfully completed an appropriate training course conducted by a legally authorized certification body.

5.5.2. Overhead Crane and Any Other Crane Operators Operation Department shall conduct training for the operators.

Only persons who had completed the training can operate the overhead crane under the supervision of the Lifting Supervisor.

5.5.3. Duties of Operator of Crane. Mobile or Tower Crane

Any person operating a crane, mobile crane or tower crane shall:

a) Not engage in any practice or maneuver, which is not in accordance with safe and sound practice.

b) Ascertain whether the ground conditions in particular the ground surface on which the crane is to be operated are safe for any lifting operation and if he is of the opinion that it is not safe for lifting operation he shall report this to the Lifting Supervisor.

c) Not use the crane for any operation for which it is not intended including pulling or dragging a load.

d) Not maneuver or hold any suspended load over and road or public area unless that road or area has been cordoned off.

e) Whenever it is required ensure that outriggers are extended and secured.

f) Before the start of erection carry out operational test on all limit Switches under no load conditions before and lifting operation,

and shall enter the results of such test.

g) Ensure that any stationery truck and wheel mounted crane is adequately and securely blocked while it is on a slope.

h) Not hoist any object if he unable to ascertain the actual weight of the object or if there is any obstruction in the path of maneuver, and if there is any such obstruction, he shall report this to the Lifting Supervisor at the site.

i) Report any failure or malfunction of the crane to the Lifting Supervisor and shall make an appropriate entry in the logbook of the crane.

j) Check and ensure the safe operation by using the checklist before every lifting operation of a mobile crane.

5.6. Approved and Examination Under The Factories Act

5.6.1. Manufacturer Test Certificate

No lifting gear, Lifting appliances and lifting machines shall be used unless it has been tested and examined by, on behalf of the manufacturer, or by an approved person. A certificate of such test and examination specifying the safe working load and signed by, on behalf of the manufacturer, or by the approved person most be obtained and kept available for inspection.

5.6.2. Examined By Approved Person

a) Every lifting gear, lifting appliances and lifting machines shall be thoroughly examined at least once in every six months by an approved person and a report of the result of every such examination in the prescribed form shall be prepared.

b) For hoist and lift, the interval for the examination by approved person is once every six month.

c) The certificate of examination must be kept available for inspection.

d) Test date or expiry date must be indicated on the lifting equipment, in addition, the Safe working Load and Identification Number must also be printed on the item.

5.7. Lifting Gear and Lifting Appliance Maintenance Programmed

5.7.1. Register of Lifting Gear and Lifting Appliances

The Lifting Supervisor shall keep and update a register of lifting gear and lifting appliances.

All lifting gears and equipment brought into the yard by the sub contractors are required to surrender to Maintenance Department for thorough inspection and registration before they are permission to put them into operations.

5.7.2. Storage of Lifting Gear and lifting appliances

All lifting gear and lifting appliances shall be stored at designated area. The designated, storage areas should be marked and a copy of the register should be displayed. Lifting gear and appliance should not be kept in personnel toolbox or cabinet.

5.7.3. Monthly Inspection by the Supervisor

Lifting Supervisor shall conduct an inspection at least once every month, to ensure that it is in good working condition, the legibility of the safe working load. A number and test date as well as the color code.

5.7.4. Color Code

Color code will be used to indicate that regular inspection has been carried out. Color code will be changed once in every six (6) months.

6. PAINTING & CHEMICAL CLEANING TREATMENT

6.1. Purpose

The purpose of this section is to provide guidelines on correct procedures and necessary precautions to be taken for painting work and chemical cleaning treatment operation.

6.2. Scope

These guidelines are applicable to all Contractor project.

6.3. Spray Painting/Painting in Confined Space

6.3.1. Application

The procedures apply to the following operations:

a) Any painting work (including brush painting) to be carried out in enclosed or semi enclosed space.

b) Any spray painting work carried out at the work area and project site, excluding spray-painting booth or areas designated for spray painting.

6.3.2. Company Supervisor's Responsibilities

The Painting Supervisor must ensure that:

a) All the particulars required in the "Permit for Spray Painting in Confined Space" are duly completed and displayed at site.

b) Adequate ventilation is provided.

c) "No Hot Work" signboards are conspicuously displayed around the area of painting to warn workers of the danger.

d) Flameproof lights are adequately provided.

e) Open paint drum/solvent must not be taken into confined/enclosed space.

f) PPE for the painters such as approved type of airline hood is used for confined space.

g) All pipelines or openings leading to other compartments are isolated.

h) All metal parts are bounded and grounded.

i) The duration of painting is strictly adhered to.

j) No work to be carried out until a permit is obtained and all above requirements are complied.

6.3.3. During Painting

a) Oxygen is not used for spray painting.

b) Spilled fluid must be cleaned immediately.

c) Should conditions warrant it, appoint a person as "Anchor Man". His main duty is to supervise from outside the enclosed or semi enclosed space and to raise alarm in event of emergency

6.3.4. After Painting

a) Adequate ventilation is maintained.

b) No entry for personnel without airline mask, Utility is checked, tested, and cleared by HSE Personnel.

c) No hot work or any other operation which may generate sparks should be carried out on the vessel, pipe line, tank etc. unless a Hot Work Permit is obtained from HSE Department and Project Shop Manager.

6.4. Procedure

6.4.1. Application

This procedure applies to the following operation:

a) Chemical cleaning at the workshop and project site, in open space or confined space.

b) Transporting of chemical into the workshop or project site in large quantity, except for area designated for the storage of such chemical.

c) Transferring of chemical at the workshop or project site.

d) Filling and draining chemical from the tank, vessel or pipeline etc.

e) Introducing any chemical /fuel /gas etc. into the pipeline. Vessel, tank, or other confined space.

None of the above work should commence until all the Safety Precautions are complied and permit is obtained from the HSE Personnel and Project/Operations Manager.

6.4.2 .Company's Supervisors Responsibilities

Supervisor / Foreman must ensure that:

6.4.2.1. Before Operation

a) All particulars required in the "Permit for introduction of chemicals into pipeline /vessel or other confined space are duly completed and display at the site.

b) Adequate ventilation is provided to prevent accumulation of dangerous gases and vapors.

C) Materials Safety Data Sheet (MSDS) is submitted to HSE Department.

d) Adequate signboards are displayed to earn hers of the operation.

6.4.2.2. During Operation

a) To stop work and inform HSE Department if there is any change

of condition which is incompatible with the job.

b) Spillage must be cleaned up immediately.

6.4.2.3. After Operation

a) No entry of personnel without adequate respiratory protection. Ventilation must be maintained.

b) To disposed off the chemical in accordance to the local environment regulation by authorized licensed contractor.

c) Hot work permit required if any hot work is to be carried out.

7. RADIATION SAFETY

7.1. Introduction

7.1.1. This radiation safety and source handling procedure specifies the minimum requirements for radiation safety and control, In order to provide an effective and safe working environment control during radiographic operation. A safe environment is required not only for Contractor's NDT personnel and employees but also for the Client's representatives and the general public.

7.1.2. This procedure also defines the responsible radiographic personnel and how to handle radioactive material (source) in an emergency situation.

7.2. Type of Radioactive Sources Use in Contractor's Yard

7.2.1. Radioactive substances are commonly used in industries to determine the internal soundness of the weld. Common type of sources used is Iridium 192 (Ir.192) In our yard we also use Selenium 75 ($Se.^{75}$) and Cobalt 60 ($Co.^{75}$) sealed radioisotopes.

7.3. Definition

7.3.1. **Licensee** is one who is a Competent Radiographer, and appointed

by the company (Contractor) and approved by Client to be responsible for the safe storage transport. Obtain of radioactive sources, and safe operation of the radiation work.

7.3.2. **Competent Radiographer** is one who is qualified to SNT-TC-IA Level 11 at a minimum in radiography method and has also attended the radiation safety course and passed the radiation safety examination conducted by Radiation Protection Inspectorate (RPI).

7.3.3. **Classified radiation worker** is one who is at least qualified in radiography method and attended the radiation safety course and authorized to perform radiation work by RPI.

7.3.4 **Controlled area** is an area must be marked with a barrier at a distance where radiation level will not exceed 2.0 mR/hr (20 mSv/hr). Only classified radiation workers are allowed inside this area.

7.3. 5. **Supervised area** is an area where the boundary dose rate limit must not exceed 0.2 mR/hr (20mSv/hr). No barriers or notices are required here, but the Radiographer must be vigilant to ensure that personnel in this area do not enter the controlled area.

7.3.6. Radiation Protection Inspectorate (RPI) is from Department of import and export a consignment of radioactive materials, issue and renewal of license to manufacture possess for sale or deal in irradiating apparatus and radioactive materials- issue and renewal of license to use handle or transport radioactive materials for a specific purpose.

7.4. *Record of Radioactive Material (Source)*

7.4.1. All radioactive materials when received should have the following record.

The date of received and from whom it was received to the activity at the date specified by manufacturer

7.4.2 . A record should be kept of the whereabouts of the radioactive material that has been used, kept update of each working day and used by whom.

7.4.3 . Where the radioactive material is depleted and need to be replaced the date. Manner of disposal which disposal agency of the depleted source should he recorded.

7.5. Radiographic Work Safety Procedure

7.5.1 . Advance notice in writing from project shall be made before undertaking radiographic work.

7.5.2. Notice shall be at least 12 hours in advance so to allow time for giving notice to the public and staffs at the work place.

7.5.3. A minimum of 2 persons and maximum 3 persons, per team with one or more Radiographers fully experienced in the practical aspects of radiography and safety and one or more assistants with sufficient knowledge to act in an emergency.

7.5.4. Whenever projecting isotope (wind out type), source container is being used. It is a legal requirement for the radiographers to possess a calibrated radiation survey meter when radiographic work is undertaken.

Each Radiographer must wear the film badge or TLD badge whenever radiation works is being carried out.

7.5.5. All radiographic work shall be carried out only during lunch hour and silent hour outside the enclosed area.

7.6. Marking of Radiation Boundary

7.6.1. A boundary shall be set up by some appropriate means e.g. rope rails, fence, wall hazardous notice etc. The radiation level outside the

controlled area shall not exceed 2.0 memo/hr (20mSv/hr) for classified worker.

7.6.2 . When working at night, warning signs shall be accompanied by flashing beacons.

7.6.3 . The boundary shall be adequately posted with clearly legible warning sign "DANGER RADIATION".

7.6.4. Adequate warning to every individual in the vicinity of and with the bounded area shall be given by audible signals, such as whistle before start of work.

7.6.5. The competent Radiographer shall maintain control over access to the controlled area affected.

7.6.6. The radiation safety level for classified personnel is 2.0 memo/hr (20 mSv/hr) and non-classified personnel are 0.2 mR/hr (20mSv/hr).

7.6.7. The radioactive materials shall be locked in the off position whenever not in used and shall not be left unattended.

7.6.8. At the end of the work shift radioactive material shall be kept under locked and secure storage area. The radioactive a material shall be returned to approve storage on completion of permitted task.

7.7. Storage of Radioactive Material (Source)

7.7.1. All radioactive materials and projectors shall be kept in approved area (bomb pit) which is in barricaded safe area.

7.7.2. The radiation level outside the storage area shall not exceed 0.2 mR/hr (20 mSv/hr). This is the safe level for the non-classified personnel to work or walk around the area.

7.7.3. Clearly marked warning signs "DANGER RADIATION AREA KEEP AWAY" shall be kept at the entrance of the storage area.

7.7.4. The storage area shall always be locked and non authorized person can remove the radioactive material.

7.8. Procedure for Radiography Work Contractor Workshop

7.8.1 .The requester will fill up the Part of the Request for Radiography Work.

The QA/QC Department will then sent senior or competent personnel (preferably a senior NDT inspector) to check the radiographic site location of the shop jointly with the requester.

7.8.2. NDT inspector will then sign the SF 07A form by filling up part II of the form.

7.8.3. A signed copy of SF 07A form will then be displayed at the designated radiography notice board by the requester.

7.8.4. NDT Inspector will then ensure that the Radiography contractor comply with the safety requirements as per checklist in Appendix B. NDT Inspector and Radiography contractor's supervisor are required to check and sign the checklist.

7.8.5. The Radiographers must place signboard at all excess points. Blinking lights to be used will be switched on before the radiography testing is in progress.

7.8.6. No individual shall be engaged in radiation work unless he holds a valid certificate of registration as a radiation worker or a license authorizing him to do, so Radiography work will be stopped if someone of such is entering the prohibited area.

7.8.7. The QC Department will give a copy of the request from to HSE Department

7.8.8. HSE officer may perform random check on HSE matters before or

during radiography work.

a) Personal Protective Equipment e.g. appropriate rubber gloves face shield. Respirator chemical suit are worn by workmen involved.

b) Workers are briefed and understood on the precautions.

c) No hot work within O feet.

e) The duration stated in the permit is strictly adhered to.

f) All electrical equipment used must be of approved explosion-proof type.

7.9. Radiation Work at Project Site or Job Site in Work Shop Which Affecting Personnel Outside the Workshop

7.9.1. This procedure is applicable to radiography work at project site or job site in Workshop which affecting personnel outside the workshop where special precaution must be taken to barricade or block the road etc.

7.9.2. All the safety precautions in Cruse 9.0 must be complied.

7.9.3. Contractor HSE Department has to be inform the QA/QC Department on the location and date / time of the radiography work to be carried out.

7.9.4. This procedure limits to x-ray machine up to 300 KpV, Selenium 75 and Iridium sealed source up to maximum of 50 curies.

7.9.5. The radiation level at all boundaries of the radiography worksite should never exceed 2.0 mrem/hr.

7.9.6. The Radiographer will then monitor randomly the exposure rate using a survey meter to ensure that the boundary is correctly placed. If the

dose rate exceeds the permissible limit the boundary will be relocated immediately. Perimeters readings shall be documented in writing and kept on file and must he available for inspection upon request.

8. WELDING & CUTTING

8.1. Purpose

To establish guidelines for the safe operation in welding and cutting tasks.

8.2. Scope

These guidelines are applicable to all EPC projects.

8.3. General Safety Rules

For all general welding and cutting works the following safety rules should be observed.

a) No cutting of any structure or lifting device is permitted without prior permission from the authorized person. Under no circumstances should a crane hook(s) be welded.

b) Welding and cutting is only permitted during non gaseous conditions in the working area.

C) Welding or cutting is only allowed upon obtaining hot work Permit.

d) The welder should he acquainted with the operating safety procedures regarding welding and cutting.

e) Under no circumstances is welding, permitted on top of or against a fuel oil or lube oil tank.

f) The welding or cutting area should have adequate ventilation.

g) There should be no hazardous liquids (spilled hydro-carbons

thinner etc.) near the welding or cutting area.

h) No welding or cutting is permitted on structures equipment that will create a potential hazard due to mechanical or electrical danger.

i) In all cases where welding of two items is undertaken and when neither item is attached to any structure, both items should be connected. Bonding should be made using mechanical clamps.

j) All repairs to equipment shall be located at a safe distance preferably upwind and in no case less than 50 feet from the area of repair, if space permits 100 feet distance is recommended.

Exceptions to the above could be the use of cranes etc. which must be closer than 50 feet to accomplish their job.

k) No welding shall take place without a permit-to-work issued on lines or vessels, which have contained hydrocarbon gas. Vessels should be steamed out or inert prior to weld repairs.

l) Welding is permitted on compressed airlines, which usually contain flammable oils or oily deposits.

m) No leaks shall be evident at the area to be welded and repair personnel not directly required to perform the welding work should stand clear preferably up wind and at least 50 feet away.

n) Gas burning, and welding torches and related hoses must be removed from all vessels and enclosed spaces or hoses disconnected at the regulations/ manifold during break and at the end of any shift. If the gas torch used is to be disconnected Burin a shift with no define assurance that its use will be resumed during that shift and then the torch and hoses must be disconnected at the manifold or cylinder regulator.

o) Cylinders must never be taken inside an enclosed space which is being done

8.4. Electric Welding and Cutting

a) Only manual electrode holders, which are specially designed for welding and cutting with a capacity capable of safer handling the maximum rated current required by the electrodes shall be used.

b) Any current carrying parts passing through the portion of the holder which the arc welder or cutler grips in his hands and the outer surface of the jaws of the holder shall be fully insulated against the maximum voltage encroached to ground.

c) Only cable free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holders is connected shall be used, except that cable with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

d) When it becomes necessary to connect or splice lengths of cable from one to another insulated connectors of a capacity at least equivalent to that of the cable shall be used, If connections are effected by means of cable lugs they shall be securely fastened together to give good electrical contact and the metal parts of the lug shall be completely insulated.

e) Cables poor repair shall not be used, when a cable becomes worn to the exposing base conductors the extent of portion thus exposed shall be by means of rubber and friction tape or other equivalent isolation.

f) A ground return cable shall be a safe current carrying capacity of

the welding or cutting unit, which it serves, when a single round return cable serves more than one unit its safe current carrying capacity shall equal or exceed the total specified maximum output capacity of the units, which it serves.

g) Pipelines containing gases or flammable liquids or conduits containing electrical circuits, shall not be used on a round return

h) When a structure e.g. piping electrical cable etc is employed as a ground return circuit. It shall be determined that the required electrical contact at all joints. The generation of an arc spark or heat at an, point can cause rejection as a ground circuit.

i) All arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire, which is grounded at the source of the current ground circuits other than by means of tale structure shall be checked to insure that the circuit between the ground and the rounded power conductor has resistance to permit sufficient current to flow to cause the fuse of the circuit breaker to interrupt the current.

J) The operator shall inspect all ground connections to ensure they are mechanically strong and electrically adequate for the required current.

k) When electrode holders are to be left unattended the electrodes shall be removed and the holders shall be so placed or protected that cannot make electrical contact with employees or metal objects.

l) Hot electrode holders shall not be dipped in water: to do so may expose the arc welder or cutter to electric shock.

m) When the welder or cutter leaves his work area or stops work for any appreciable length of time or when the welding machine is to be moved the power supply switch shall be open.

n) Any faulty or defective equipment shall he reported to the Supervisor.

o) Whenever practical all arc welding and cutting operations shall he shielded by non combustible or flame-proof screens which will protect employees and other persons working in the vicinity from the direct rays or the arc.

p) Before any welding cutting or brazing operations the location of the nearest fire extinguisher shall be determined.

q) Clothing which is oily or with open pockets and cuffs must not be worm while welding Flying sparks or hot slag may ignite the clothing.

r) When welding in confined areas be sure your work area is well ventilated. Never use oxygen for ventilation.

s) Sparks hot metal or slag must not be allowed to fall on any combustible materials on lower levels.

8.5. Gas Welding & Cutting

It is important that all works, which involve the use of gas, be properly controlled and maintained. This type of work will be a major fire and explosion hazard if safety requirements of the operation are not met.

8.5.1. Color Coding for Gas Hoses

a) Gas — Hose Color

Acetylene — Red

Oxygen	Blue
Air	Black
LPG	Orange

b) Gas hoses must be checked for leakage daily by the users before operation. A much thorough check, which includes immersing the hoses in the water bath will be carried out by the Subcontractor Foreman and witnessed by HSE Personnel. Records of such checks will then be submitted to HSE Department

c) Gas hoses must be shut and disconnected from the gas manifold or gas cylinder after work.

d) Gas hoses must be removed from any confine space when not in use.

e) Care must be taken to protect hoses conveying the gases against damage of kink.

f) When joining various lengths of hoses use only approved connectors.

8.5.2. Cylinders

a) Cylinders which contain or have contained oxygen or any other gas under pressure should not be installed or placed within 5 meters from blowpipe or torch in use.

b) Do not expose gas cylinder at direct ray of sun or heat. They must be secured and placed well and protected away from any sources of heat e.g. generators, boilers or hot-work operations.

c) International color code for the cylinders should be maintained in order to identify the contents accurate'

- Acetylene-Maroon

- Oxygen-Black
- Argon-Blue

d) Never allow cylinders to come into contact with electrical apparatus or live wires.

e) All gas cylinders should be stored in such a manner that filled or falls ones. Particularly oxygen and flammable gases: be separated from the empty ones. Distinctive notices should be displayed to prevent confusions. Oxygen and fuel teases should be stored separately.

f) lf a cylinder becomes accidentally overheated or damaged the supplier must be notified immediately and the cylinder put to one side ready for collection.

g) Cylinders should be handled in racks or trolleys.

8.5.3. Accessories

a) Approved flashback arrestors must he installed at every gas torch inlet for oxygen and fuel gas. The flashback arrestors must also be installed at oxygen fuel gas manifolds cylinders outlets.

b) Under no circumstances should oil or grease be introduced to the spindle of the valves or regulator or the gas cylinders.

c) Cylinders and fining must be kept away from source of contamination such as oil or grease.

d) Proper regulating valves should be provided on cylinder containing oxygen fuel under pressure and they must be maintained in good working order.

e) Cylinders should be used in upright position to prevent any blowout of the all assembly from causing injuries to personnel.

8.5.4. Others

a) Adequate ventilation must be provided when carrying out welding work in a confined space.

b) Never use oxygen to provide ventilation or any other purpose not meant for the usage.

c) Naked flames should not be introduced to the vicinity of oxygen and acetylene cylinders.

d) Good natural ventilation should be provided for all gas cylinder storage areas.