سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

HSE ORGANIZATION, STRUCTURE, GOALS AND OBJECTIVES

Prepared and Issued by

SABQ Energy Contracting Group

Contents

1.0 Introduction

1.1 Purpose

The objective of this standard operating procedure is to ensure the requirements of HSE organization, structure, goals and objectives within organization at various levels and provide framework for documenting HSE performance and reviews at corporate and project sites.

1.2 Scope

This document shall be applicable to head office, workshop and all the project sites of *SABQ Energy Contracting Group Co. Ltd.*

2.0 Terms and definition

C.E.O: The chief executive officer (CEO) is the top position in an organization and is responsible for implementing existing plans and policies.

HSE: Health, safety and environment

ISO: The International Organization for Standardization is an international standard-setting body composed of representatives from various national standards organizations

JSA: A job safety analysis (JSA) is a procedure which helps integrate accepted safety, health and environment principles and practices into a particular task or job operation. It includes hazard identification and its control measures.

S.M.A.R.T: Specific, Measurable, Achievable, Relevant, Time bound.

SOP: A standard operating procedure is a set of instructions covering those features of operations that lend themselves standardized procedure without loss of effectiveness.

Accident: An unplanned, unwanted event that results in personal injury, fatality or property damage.

Agenda: List of things/topics to be discussed in a meeting.

Appraisal: A performance appraisal is a regular review of an employee's job performance and overall contribution to a company**.**

Compliance: The state of being in accordance with established safety standards and regulations, or the process of becoming so.

Haphazard: An unplanned system, lacking any obvious principle of organization.

Hazard: Anything that has potential to cause harm.

Near Miss: Any unwanted event that had potential to cause harm.

Proactively: To take action before any unwanted situation occurs.

Shall: Mandatory and expressing a strong intention.

Stipulation: A condition or requirement that is specified as a part of agreement.

Recordable Injury: Recordable injury or illness under OSHA is one that requires medical treatment beyond first aid, as well as one that causes death, days away from work, restricted work or transfer to another job, or loss of consciousness.

Risk: It is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

Risk Assessment: A risk assessment is a thorough look at your workplace to identify those things, situations, processes, etc. that may cause harm, particularly to people.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall be responsible to ensure all the resources to implement all the guidelines as per procedures.

3.2 Project Manager/Site Manager/ Works Manager

- Shall be responsible to provide and maintain a safe, risk-free and healthy work environment for employees in accordance with local legislation and stipulation laid down in HSE management system.

3.3 Corporate HSE Manager

- Shall advise the management on all safety, health and environment matters to ensure that the company complies with its statutory obligations and keep HSE structure aligned in accordance with ISO 14001, ISO 45001 etc.
- Shall be responsible for monitoring the application of this procedure by regular compliance audits.
- Shall be responsible to provide support in the acquisition of suitable trainings (internal/external), training material, awareness sessions and adequate communication.
- Shall be responsible for the revision of this procedure as per defined frequency and/or as required.

4.0 Procedure

4.1 Leadership and Commitment

SABQ Top Management shall provide strong and visible leadership to promote a culture in which all employees share a commitment to HSE. They shall do this through setting a personal example, demonstrating commitment to implementing the HSE Management System (MS), communicating HSE expectations with employees, discussing and reviewing progress against specific HSE targets and demonstrating personal participation in HSE activities.

SABQ top management shall be proactive in target setting. They shall do this through developing and discussing improvement targets, ensuring staff have HSE targets in their appraisals, participating in the review of HSE indicators, providing immediate and visible involvement in incidents and in setting targets.

SABQ top management shall demonstrate informed involvement in HSE issues. They shall do this through reviewing the progress in the development and content of the HSE MS, making resources available to meet HSE targets and undertaking relevant HSE training. In addition, they shall be fully aware of the high priority areas for improving SABQ HSE MS and are personally involved in improvements arising from formal management reviews of the HSE MS.

SABQ top management seeks to create and sustain a Company culture in which all employees share a commitment to HSE. All employees and sub-contractors shall be involved in creating and maintaining this supportive culture.

4.2 Policy

SABQ has established its HSE Policy for compliance of mandatory requirements of ISO 45001 and ISO 14001. HSE Policy shall be communicated to all employees of SABQ as to promote company's approach towards HSE. The company's policy includes following points:

- Demonstrate visible and active leadership in all of our business activities by providing resources necessary to manage and communicate HSE commitment, expectations, and accountability in the same manner as any other critical business function.
- The safety of our employees at work is a core value. No other business objective has higher priority.
- Health, Safety and Environment is everyone's direct responsibility. Annual appraisal of each employee is linked with their HSE compliance.
- Implement effective HSE management system in true spirit to safeguard people, asset, environment and reputation of the organization proactively in a systematic manner.
- Adhere and comply with all applicable laws, regulation, legal requirements, and HSE standards and adopt best practices.
- Develop processes that facilitate continual improvement in HSE management system and our HSE performance.
- Set objectives, targets, measures, and report HSE performance. Review and continuously monitor the HSE performance to ensure continual improvement in all aspects.
- Ensure incident reporting of all injuries, accidents, and occupational illness and their investigations have a fundamental importance in their prevention.
- Establish HSE audit system and evaluate the practices, procedures, and implement the necessary actions to maintain and improve Health, Safety & Environment of employees, customers and contractors.
- Ensure proactive hazard & risk identification related to business processes in order to prevent environmental impact, ill-health and injuries.

4.3 Goals and Objectives

Management shall set competitive goals and objectives in order to have excellence in health, safety and environment for a sustainable and competitive business solution. Setting objectives and achieving them will make the difference between a haphazard trip and a carefully planned journey. These goals and objectives shall be recorded on **QA-FRM-001**.

4.3.1 Goals

- All HSE goals shall be reasonably practicable that can be achieved and reviewed later to see the progress.
- All the targets should have compliance with international standards.
- Goals shall be easy to comprehend for all the employees.

- Challenging goals and objectives shall be set annually.
- Both numerical and descriptive goals shall be set.
- The establishment of all the goals should be created using the S.M.A.R.T. philosophy:
  - **S**pecific (simple, sensible, significant).
  - **M**easurable (meaningful, motivating).
  - **A**chievable (agreed, attainable).
  - **R**elevant (reasonable, realistic and resourced, results-based).
  - **T**ime bound (time-based, time limited, time/cost limited, timely, time-sensitive).

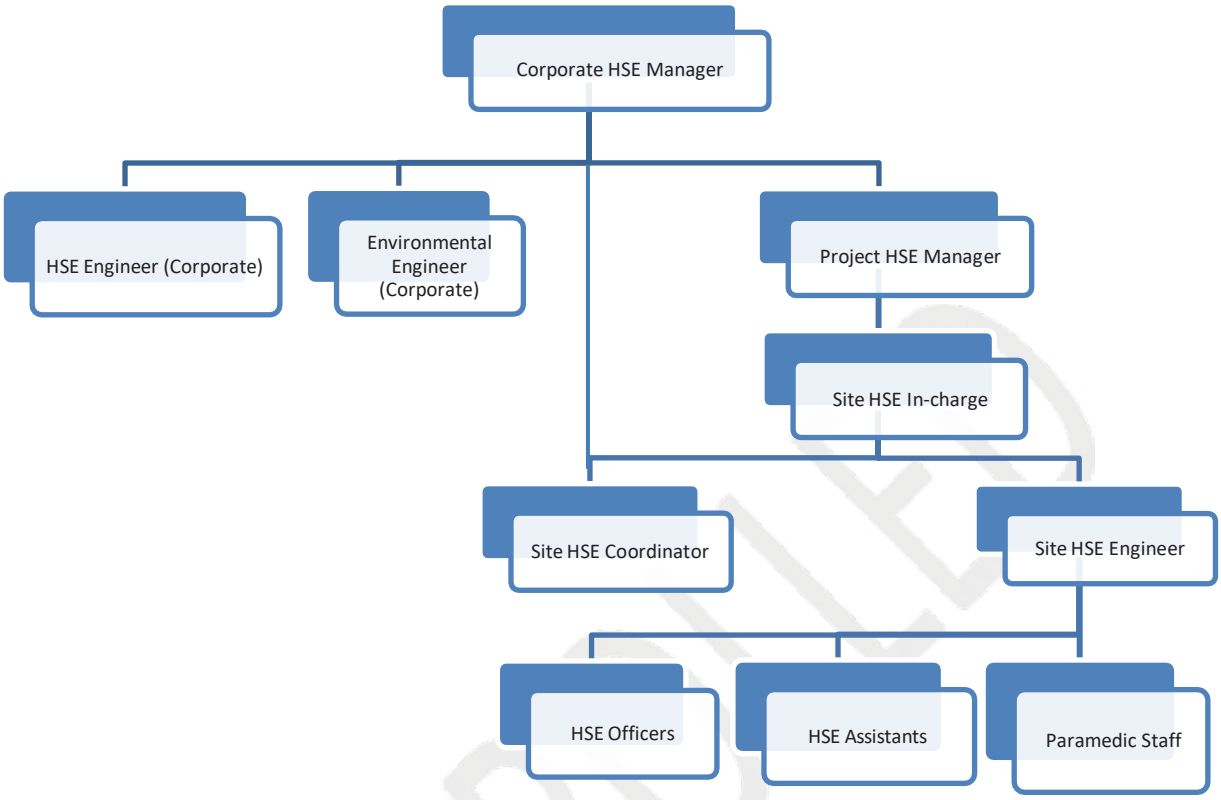
4.3.2 Objectives

- Individual evaluation and appraisal of staff shall depend upon their HSE performance in a given time.
- Site and corporate HSE team shall also be evaluated on the amount of their targets achieved.
- Annual review of HSE performance to be undertaken against targets and objectives set out in committee meeting.
- Annual improvement plans shall be developed and integrated into overall annual business planning processes.
- Reward and incentive schemes shall be dependent upon HSE performance.
- At a minimum, HSE program should reflect these four basic elements:
  - Management Leadership and Employee Involvement,
  - Worksite Analysis,
  - Hazard Prevention and Control, and
  - Safety, Health and Environment Training.

- Objectives shall aim at specific areas of performance that can be measured or verified. For example make weekly inspection or observations should be corrected within 24 hours.
- Objectives shall be realistic and attainable, but they shall still present a significant challenge. Example: "Reduce recordable injuries in the upcoming year by 100 percent."
- Objectives shall be understood by all those directly involved. No doubts shall be left about what is to be accomplished.

4.4 HSE Structure

HSE organization and hierarchy of SABQ is shown in the “HSE Organizational Flowchart” below. The roles and responsibilities of each HSE personnel involved in Project HSE are provided in **HSE-SOP-002**. The HSE team may vary depending upon the requirement at site and at corporate level.



HSE Organizational Flowchart

4.5 Management Review

To achieve the desired performance from an HSE Management System, the system needs to be reviewed on a regular basis. The purpose of the review is for an organization's senior leadership to evaluate, manage and continually improve the performance of its HSE management system.

4.5.1 Corporate HSE Committee

An effective Corporate HSE Committee shall be made to develop strategies to make the work environment safe and healthy. Committee shall work to increase awareness of health and safety issues among workers, supervisors, and managers; and to see the effectiveness of the HSE related programs.

- **Size and members of committee**

  The size shall be manageable and shall be decided by the CEO. Relevant authorities should be part of the committee. Corporate HSE Manager shall be mandatory member in the committee.

➢ **Roles and responsibilities of committee**

- Review injury data, accident reports, and worker's compensation records and make recommendations for appropriate corrective action.
- Conduct HSE job analyses to identify problems.
- Design and conduct health and safety surveys.
- Propose and evaluate various ways to improve HSE practices.
- Review and evaluate corrective actions taken by management.
- Establish or improve procedures for employees to report safety hazards or suggest improvements without fear of reprisal.
- Respond to concerns raised by workers, supervisors and managers.
- Plan and organize training programs.
- Develop a tracking system that enables the committee to monitor progress on safety issues.

➢ **Committee meeting**

Committee meetings are essential to discuss and plan the pathway to achieve HSE goals.

- A committee meeting shall give opportunity to raise HSE related issues that will be observed while setting management system.
- Corporate HSE department shall organize agenda items in advance. (Members of the committee should be consulted to determine whether any issue need to be included in the agenda.) Agenda shall be circulated through an email.
- Committee meeting shall be chaired by CEO.
- Review of last minutes of meeting and status of pending issues or on-going activities of the last meeting shall be discussed.
- Recommendations shall be given by all committee members to improve HSE management system.
- Attendance shall be marked. (**Annexure A**-Attendance Sheet).
- Tentative date, location and time of next meeting shall be discussed.
- Minutes of meeting shall be recorded and communicated by Corporate HSE to all concerned authorities **(HSE-FRM-001)**.
- Committee meeting shall be conducted quarterly with availability of maximum members, especially C.E.O.
- HSE corporate committee can invite other employees if required to discuss any related issue.

4.5.2 Site HSE Meeting

The Site HSE Committee meeting shall be held at each work site shall be prepared and held on a monthly basis. However, the frequency of meetings may be increased or decreased, if requested by Client or necessary for HSE improvement.

The Project Manager and/ or Site Lead, Site HSE Representative, Site QA/QC Representative, Site Admin Representative, including Subcontractors' Site Manager shall participate in the

Committee; Client representative can join the HSE Committee on their own will, the following topics shall be discussed and reviewed.

1) Improvement of Work Environments for Safe Work
2) HSE activities agenda
3) Site inspection and Audit Reports
4) Accident Investigation Report and Recurrence Prevention plan
5) Site Specific HSE performance Review

In addition, the minutes of this meeting, attendees and the HSE Performance report shall be recorded and retained for audit purpose by client, which gained HSE related data i.e. HSE Statistics, Audit Result, Training Status, Award & Disciplinary Action taken etc., during the month shall be reported to Corporate HSE SABQ Head office.

4.5.3 Continual Improvement Objectives

- HSE Committee shall conduct regular reviews of the organization's HSE management system and performance in order to have continual improvement in the system.
- To review significant aspects and legal or other requirements that pose a potential impact to the organization.
- To summarize the performance of the Management System regarding its suitability, adequacy and effectiveness.
- To provide required or recommended changes to the Management System such as policy, standards, objectives, programs or procedures.
- To recommend any actions or plans to improve the Management System.
- To follow P.D.C.A. (Plan, Do, Check, Act) cycle to identify opportunities to streamline work, eliminate non-conformance and reduce unsafe activities.
- To improve the overall efficiency of the HSE management system to have a proactive system rather than reactive.

5.0 References

- Section 16 OHS Act
- ISO 14001:2015 Environmental Management System
- ISO 45001:2018 Occupational Health and Safety
- ADNOC HSE Management system Guideline

6.0 Attached Documents

- **Annexure A:** Attendance Sheet
- **HSE-FRM-001**- Minutes of HSE Meeting

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

HAZARD IDENTIFICATION AND RISK ASSESSMENT

Prepared and Issued by

SABQ Energy Contracting Group

Contents

1.0 Introduction

1.1 Purpose

The objective of this procedure is to provide guidelines in order to identify hazards & risks related to Human, Assets, and Environment & Reputation of the organization through systematic process to implement controls for mitigation measures associated with all activities of the operations of company.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of Elite Engineering Private Limited. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definitions

ALARP: **As low as reasonably practicable** is a term used in the regulation and management of safety-critical and safety-involved systems. The ALARP principle is that the residual risk shall be reduced as far as reasonably practicable.

COMAH: **Control of Major Accidental Hazards** regulations ensuring that businesses: "Take all necessary measures to prevent major accidents involving dangerous substances. Limit the consequences to people and the environment of any major accidents which do occur"

EEPL: Elite Engineering Private limited

EIA: **Environmental Impact Assessment** is the assessment of the environmental consequences (positive and negative) of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action.

ENVID: **Environmental aspect Identification.** The ENVID review enables to identify environmental aspects that come about due to an interaction between the facility and its surroundings in order to plan for, avoid, or mitigate their potential impacts.

HAZID: **Hazard Identification** is a qualitative technique for the early identification of potential hazards and threats effecting people, the environment, assets or reputation.

HAZOP: **Hazard Operability** is a structured and systematic examination of a complex planned or existing process or operation in order to identify and evaluate problems that may represent risks to personnel or equipment.

HEMP: **Hazard and Effect Management Process**. This methodology identifies various hazards at the facility and assesses management of the identified hazards

HSEIA: **Health Safety and Environmental Impact Assessment** is a systematic process of identifying the impact of existing, new or substantially altered projects on health, safety and the environment.

MHSWR: Management of Health and Safety at Work Regulation

NDT: **Non-Destructive Testing** is a wide group of analysis techniques used in science and technology industry to evaluate the properties of a material, component or system without causing damage.

QRA: **Quantitative Risk Assessment** is a formal and systematic approach to estimating the likelihood and consequences of hazardous events, and expressing the results quantitatively as risk to people, the environment or your business

RAM: Risk Assessment Matrix

R.R: Risk Rating

SIL: **Safety Integrity Level** is defined as a relative level of risk-reduction provided by a safety function, or to specify a target level of risk reduction.

TRA: **Task Risk Assessment** is the process of identifying hazards and of specifying steps to mitigate the hazards for a specific job or task.

Acceptability: The minimum level or quality of something allowed.

Asset: An asset is an expenditure that has utility through multiple future accounting periods.

Brainstorming: It is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members.

Catastrophic: Involving or causing sudden great damage or suffering like death.

Critical Job/System: Those equipment, jobs and systems whose failure could cause or contribute to an accident with severe or catastrophic consequences or whose purpose is to prevent or limit the effect of such accidents.

Degradation: The process or act of get destroyed or spoiled.

Discretion: The freedom to decide what should be done in a particular situation.

Exceedance: The act or fact of exceeding something, especially a limit or standard.

Hazard: Something that has potential to cause harm e.g. electricity, fire.

Hazardous Event: Event that can cause harm e.g. the incident which occurs when a hazard is realized such as release of gas, fire.

Inherently: In a permanent, essential, or characteristic way.

Intuitive Analysis: The ability to make quick decisions when time is short based on previous experience. This does not mean decisions are made haphazardly, or merely on a gut feeling.

Liaison: communication or cooperation which facilitates a close working relationship between people or organizations.

Likelihood: The state or fact the something has a chance to happen.

Major Injury: It is any **injury** that has the potential to cause prolonged disability or death.

Minor Injury: It include first aid treatment like sprain, strain, wound, headache etc

Natural Calamities: An event causing great and often sudden damage or distress; a disaster.

Precedence: The condition of being considered more important than someone or something else.

Probability: Measure of chances, likelihood that an event will occur.

Radiography: **Industrial radiography** is a method of non-destructive testing where many types of manufactured components can be examined to verify the internal structure and integrity of the specimen. It is done using X-rays or gamma rays.

Residual Risk: It is the threat/risk that remains after all the efforts to identify the risk and precautionary measures to eliminate that **risk** have been made.

Risk: It is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

Risk Assessment: A risk assessment is a thorough look at your workplace to identify those things, situations, processes, etc. that may cause harm, particularly to people.

Severity: The fact or condition of being intense.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

Shall be the owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.

3.2 Project Manager/Site Manager/ Works Manager/HR Manager

- Shall be responsible for the implementation of this procedure and for ensuring that all necessary risk assessment is undertaken by the relevant sections on the project and that all actions arising from the risk assessment are fully implemented.
- Shall be responsible for ensuring that personnel who are required to undertake risk assessments have received the required training.
- Shall be responsible to ensure the availability of HSE resources as per given details in Project HSE Organization procedure for the compliance of HSE Management System.

3.3 Corporate HSE Manager

- Shall be responsible for monitoring the application of this procedure by regular compliance audits.
- Shall be responsible to provide support in the acquisition of suitable trainings (internal/external), training material, awareness sessions and adequate communication.
- Shall be responsible for the revision of this procedure as per defined frequency and/or as required.

3.4 Project Engineer

- Shall be responsible to ensure that all risk assessments are adequately coordinated, documented, filed, reviewed and followed up.
- Shall ensure that the responsible persons for the relevant sections shall be responsible for establishing a plan and scope for risk assessment to be carried out within the area of responsibility.
- Shall ensure that all supervisors and HSE personnel at project site shall contribute to the risk assessment performance within the area of responsibility.

3.5 HSE Engineer/Officer

- Shall be responsible to contribute to the risk assessment performance within the area of responsibility.
- Shall be responsible to monitor & implement the controls for mitigation measures identified after the assessment of hazards & risks at project site.

- Shall be part of the team for audits and inspection to be carried out for identifying hazards and risks while conducting risk assessment.

4.0 Procedure

The purpose of this procedure is to establish a formal system for the performance and documentation of risk assessment of Health, Safety and Environmental issues expected on all business activities of SABQ project sites, workshop, head office etc.

The risk assessment will be performed on a variety of activities on the site with the aim of identifying all the possible hazards, which may be encountered, and to establish the means by which the hazards can be eliminated/reduced and/or controlled.

The outline stages for performing these assessments, as detailed herein, are;

- The identification of hazards.
- An introductory evaluation of the associated risks.
- Determination of mitigation measures.
- Assessment of control effectiveness, by continuous monitoring.

This system shall be based on the Hazards and Effects Management Process (HEMP).
A key element in identifying and managing hazards in SABQ is a systematic approach to the identification of hazards and the assessment of the associated risk in order to provide information to aid decision-making on the need to introduce risk reduction measures.

Risk reduction measures should follow this hierarchy:

- Elimination of the hazard, e.g., adoption of an alternative activity.
- Prevention of incidents (i.e. reduction of the probability of occurrence).
- Control of incidents (i.e. limit the extent and duration of a hazardous event)
- Mitigation of the effects (i.e. reduce the consequences / effects).

Elimination of the hazard should always be first choice, followed by preventative measures, such as using inherently safer design or adopting safe operating procedures. Mitigation of consequences, e.g., by use of appropriate PPE, should always be last choice.

Risk control is the reduction and maintenance of Risk at an acceptable level which is considered to be an ALARP “As low as Reasonably Practicable”.
Measures to recover from incidents should be provided based on risk assessment and should be developed taking into account possible failures of the control and mitigation measures. Based on the findings of the evaluation, detailed health, safety and environmental objectives and management programs should be set at appropriate levels.

4.1 Identification of Hazards

Hazard is an actual or potential condition, situation, or event that can result in injury, illness, or death of personnel. In addition, a hazard can result in damage, loss, or destruction of equipment or a serious degradation of capabilities or total failure of the project or mission. Hazards are found in all environments and in all situations. Hazards are identified through experience, historical data, intuitive analysis, judgement, standards, brainstorming, and a large variety of other means and methods. Hazard identification is, without a doubt, the most important step, in the risk management process. It must also be noted that hazard identification is a continuous process and should be repeated throughout the work period. The specific method of hazard identification will change from site to site and from task to task.
However, the basic process to systematically identify hazards in the work place includes the following:

- Identify specific work areas.
- Review previous documents or data involved in the operation to determine if prior injuries or accidents have occurred as a result of this task.
- Conduct an on-site, visual inspection of the work area.
- Determine the individual job tasks of individuals.
- Break the individual job tasks into steps.
- Analyze each job task and identify the hazards or potential hazards involved in performing these tasks.

Hazard identification mainly focuses on the identification of hazards in the following four categories:

- People
- Assets
- Environment
- Reputation

The systematic procedure of identification of hazard must be recorded in **Hazard register (HSE-FRM-004)**. The register shall have information of maximum identified hazards corresponding to the each activity in the job. The register shall also give an idea of the risk level and its priority to be rectified.

The broad categories of Hazards are:

- Mechanical (Fall / Slip due to slippery floor, Exposure to moving / rotating parts of machinery etc.)
- Electrical (Electrocution / Electrical Shocks)
- Chemicals (Acids/ Alkalis / Salt etc.)
- Fire and Explosion
- Radiation (Exposure to X-RAY / Radiography during NDT etc.)
- Toxic Release (release of toxic gases like ammonia, chlorine, etc.)
- Natural Calamities (Earth quake, flood, storm etc.)

- Biological (Bacteria, viruses, insects, plants, birds, animals and humans. These sources can cause a variety of health effects ranging from skin irritation and allergies to infections e.g. TB, Cancer etc.

4.2 Risk Assessment, Evaluation & Management

Risk Management process is risk management evaluation, whereby the effectiveness of the techniques employed to identify, analyze and treat risks are assessed and further action taken when warranted. If improvement and/or resolution of the risks are evident, additional follow-up will be done at predetermined intervals to evaluate continued improvement.

4.2.1 Risk

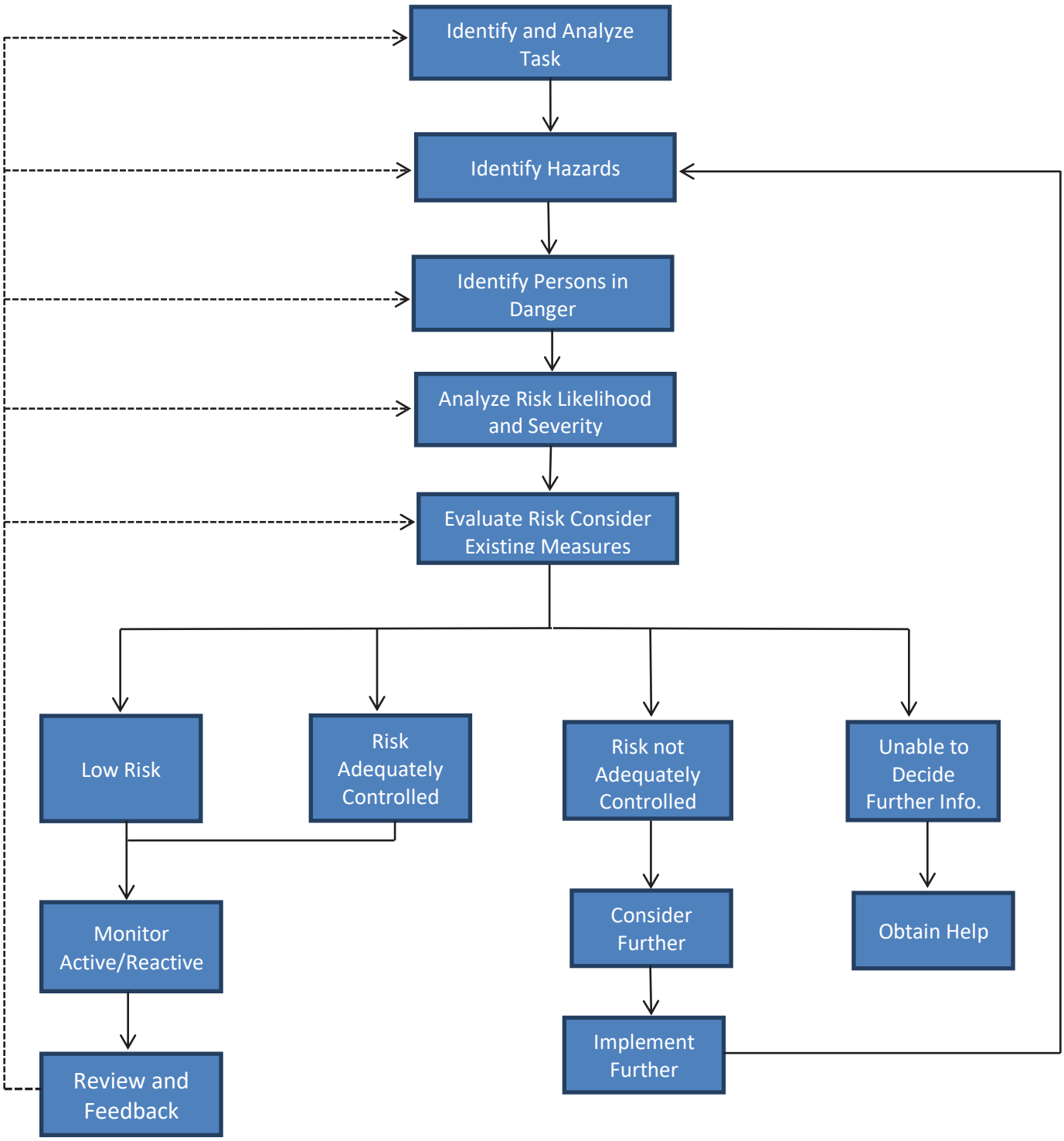
The basic approach to the management of risks in health and safety can be summed up in the following stages:

1. Consider all tasks and situations.
2. Identify the hazards that are, or may be, involved.
3. Identify those who may be exposed to the hazards.
4. Analyze the risks of injury or loss from the hazards.
5. Evaluate if the risk is adequately controlled.
6. Consider measures that may eliminate or reduce risk further in line with the basic principles of hazard control (ALARP).
7. Implement the risk control measures.
8. Monitor the measures.
9. Review and feedback any corrective action.

Risk = Probability of the event x the consequences

Here are some guidelines for risk level categorization:

1. High x High = High
2. High x Medium or Medium x High = High
3. High x Low or Low x High = Medium
4. Medium x Medium = Medium
5. Medium x Low or Low x Medium = Medium
6. Low x Low = Low



Risk Management Process Flow

4.2.2 Risk Assessment and Evaluation

Hazards identified for each task subject to risk assessment will be analyzed to determine the risk value and level which should be controlled accordingly. Assessment of risk involves following stages:

- Identify factors that may be contributing to the risk.
- Review health and safety information that is reasonably available from an authoritative source and is relevant to the particular hazard.
- Evaluation of how severe the harm could be.
- Evaluation of how a hazard may cause harm.
- Determining the likelihood of harm occurring.

Consequence: The outcome of an event especially as relative to an individual, asset, reputation or environment.

Consequence Description (The highest value in the relevant category will always be used)			
Value	**Result of Hazard to People**	**Risk Rating**	**Description of Severity**
5	Catastrophic	Extreme	Multiple Fatalities. Total or substantial loss of assets. Massive environmental impact over a large area. Constant high exceedance of statutory limits. International media attention.
4	Severe	High	Single fatality. Two weeks shutdown. Severe environmental impact. National media attention and public concern.
3	Critical	Medium	Long term/irreversible injury/illness, Short term/partial shutdown. Localized environmental impact with no long term consequences. Extensive attention in local media.
2	Marginal	Low	Short term injury/illness with full recovery. Brief disruption to production. Minor environmental contamination. Limited local concern.
1	Negligible	Insignificant	First aid/medical treatment case. Slight plant damage, no disruption to operation. Environmental damage within site boundary only. No public concern.

Table-1: Harm to People

Probability: A measure of how likely it is that some event will occur; a number expressing the ratio of favorable cases to the whole number of cases possible.

Probability	Probability Category	Risk Rating	Guidance on Likelihood
Frequent	E	Extreme	Likely to happen several times per year at the location under consideration.
Probable	D	High	Has happened several times in Elite Engineering Private Limited previously and known to occur elsewhere several times per year worldwide.
Occasional	C	Medium	Could happen once in the life of the project or operation. Has happened in Elite Engineering Private Limited before.
Remote	B	Low	Unlikely to occur during the life of the project/operation, although has been known elsewhere in other companies.
Improbable	A	Insignificant	Unlikely event. May have occurred worldwide but not known in Elite Engineering Private Limited.

Table-2: Probability Categories

For establishing risk it is represented as:

Risk = Severity of Consequence X Probability/Likelihood of Occurrence

For risk assessments, the Consequence categories are applied to both personnel and property/progress.

In the cases where a category will be applicable to both people and property (most cases) the one applicable to personnel will, in general, take precedence.

The risk analysis estimated is made of the Consequences and Probability of each hazard identified. The product of these two is defined as the risk value.

a) Job Safety Analysis

The job safety analysis (JSA) is a tool for documenting hazards and developing risk minimization plans that incorporate engineering, administrative controls and personal protective equipment.

The purpose of JSA is to plan a safe conduct of work by employees. Existing and potential work area hazards shall be identified and actions to be implemented to eliminate or minimize

risk of injury, illness, property damage, environmental degradation, or other loss. The entire process (identifying hazards, minimizing risks, and managing residual hazards) is reflected in a Job Safety Analysis. A "Job Safety Analysis" is essentially a risk assessment process. It need not be overly complicated, and consists of four practical steps:

1. Identifying job hazards.
2. Mention the appropriate preventive measures to eliminate hazards or minimize risk.
3. Evaluating risks, including the likelihood of an adverse event and the magnitude of consequences.
4. Assign responsible authorities to eliminate hazards in each job.

Job Safety Analysis shall be performed by line supervisor in consultation with HSE representative for all potentially hazardous activities during construction phase of the project to systematically identify the hazards related to the activities, evaluate and assess the potential consequence and determine respective necessary controls to mitigate the threats. **JSA** shall be recorded on a controlled document **(HSE-FRM-002)** and shall be used where required during company's operational activities.

b) Requirements of Risk Assessment

- The hazards and risks associated with the project activities shall be identified by the HSE Engineer according to set methodology by internal system of Company or by Client.

- Requirement of risk assessment and control during engineering and procurement stage of project shall be identified by HSE Engineer in liaison with HSE Manager.

- Hazard identification and risk assessment studies are should be carried out to safeguard all aspects. The studies may include HAZID, ENVID, COMAH, HAZOP, QRA, HSEIA, EIA, SIL etc. according to the need of the process and/or execution activity by using HSE Risk Assessment Matrix (Figure-RAM)

- When determining controls for assessed HSE risks, consideration shall be given to reducing the risks according to the following hierarchy (Figure: Hierarchy Of Control):

  - Elimination of risk
  - Reduction/ Isolation of risk
  - Substitution of risk
  - Engineering/Administrative Controls
  - Personnel Protective Equipment

c) Risk Assessment Matrix (RAM)

Severity	Consequences				Probability				
					A	B	C	D	E
	People	**Assets**	**Environment**	**Reputation**	Improbable	Remote	Occasional	Probable	Frequent
5. Catastrophic	Multiple Fatalities	Extensive Damage	Massive Effect	International Impact		**HIGH RISK LEVEL**			
4. Severe	Single Fatality or Permanent Disability	Major Damage	Major Effect	National Impact					
3. Critical	Major Injury or Health Effects	Local Damage	Localized Effect	Considerable Impact	**MEDIUM RISK LEVEL (ALARP REGION)**				
2. Marginal	Minor Injury or Health Effects	Minor Damage	Minor Effect	Minor Impact					
1. Negligible	Slight Injury or Health Effects	Slight Damage	Slight Effect	Slight Impact	**LOW RISK LEVEL**				

Table-3 HSE Risk Assessment Matrix

d) Risk Rating and Assessment

Risk is the probability that a hazard will result in an adverse consequence. Assessing risk of potential hazards helps to determine the proper mitigation strategy and priorities. Risk ratings and scaling can show where additional resources are required. In this section we will focus on rating risks using probability of occurrence and severity of consequences scales.

We can do what is called a Qualitative Risk Rating which means we can simply decide whether the risk is minimal, low, medium or high. Generally this short hand form of risk rating is used to determine which hazard should take priority over another in terms of deciding what to do and when.

Similarly, we can do semi-quantitative risk rating by giving a value to the risk which can assist to take residual risk out of our assessment. Assigning a number to probability and severity will help us know the level of risk involved in the job.

e) Task Risk Assessment

All the identified hazards shall be evaluated in terms of Task Risk Assessments using **"likelihood of occurrence"** and **"severity of consequences"** through HSE Risk Assessment Matrix. They are comprehensive assessment tools and provide greater differentiation of risks based on execution activities.

Using this kind of scaling, hazard risk rating is calculated as follows:
Risk Rating (RR) = Likelihood of Occurrence x Severity of Consequences

As the formula indicates, the higher the assessed probability of occurrence and severity of consequences, the greater the risk rating will be.

These calculations shall be recorded in TRA form **(HSE-Form-003)** which is an essential documentation which shall be used during this risk assessment. It shall highlight the risk level and rating before and after corrective actions.

Task Risk Assessment is jointly prepared by Project Engineer and HSE Engineer shall be reviewed by HSE Manager and approved by Project Manager.

Risk Rating = Severity X Likelihood		Severity				
		1 Insignificant	2 Low	3 Medium	4 High	5 Extreme
Likelihood	5 Extreme	5	10	15	20	25
	4 High	4	8	12	16	20
	3 Medium	3	6	9	12	15
	2 Low	2	4	6	8	10
	1 Insignificant	1	2	3	4	5

Table-3: Risk Rating Methodology

Insignificant Risk	Low Risk	Medium Risk	High Risk	Extreme Risk
1	2-4	5-10	11-19	20-25

4.3 Risk Reduction, Mitigation & Control

Once the risk has been analyzed, they must then be assessed against agreed acceptability criteria. Below is an indication of the action and time scale for addressing control measures.

Risk Level	Action / Time Scale
Extreme	Stop: No work is allowed
High	Immediate: Before work is started or allowed to continue
Medium	Control to be in place as soon as practicable
Low	Consider the cost benefits of improved controls
Insignificant	No impact on operation or no activity

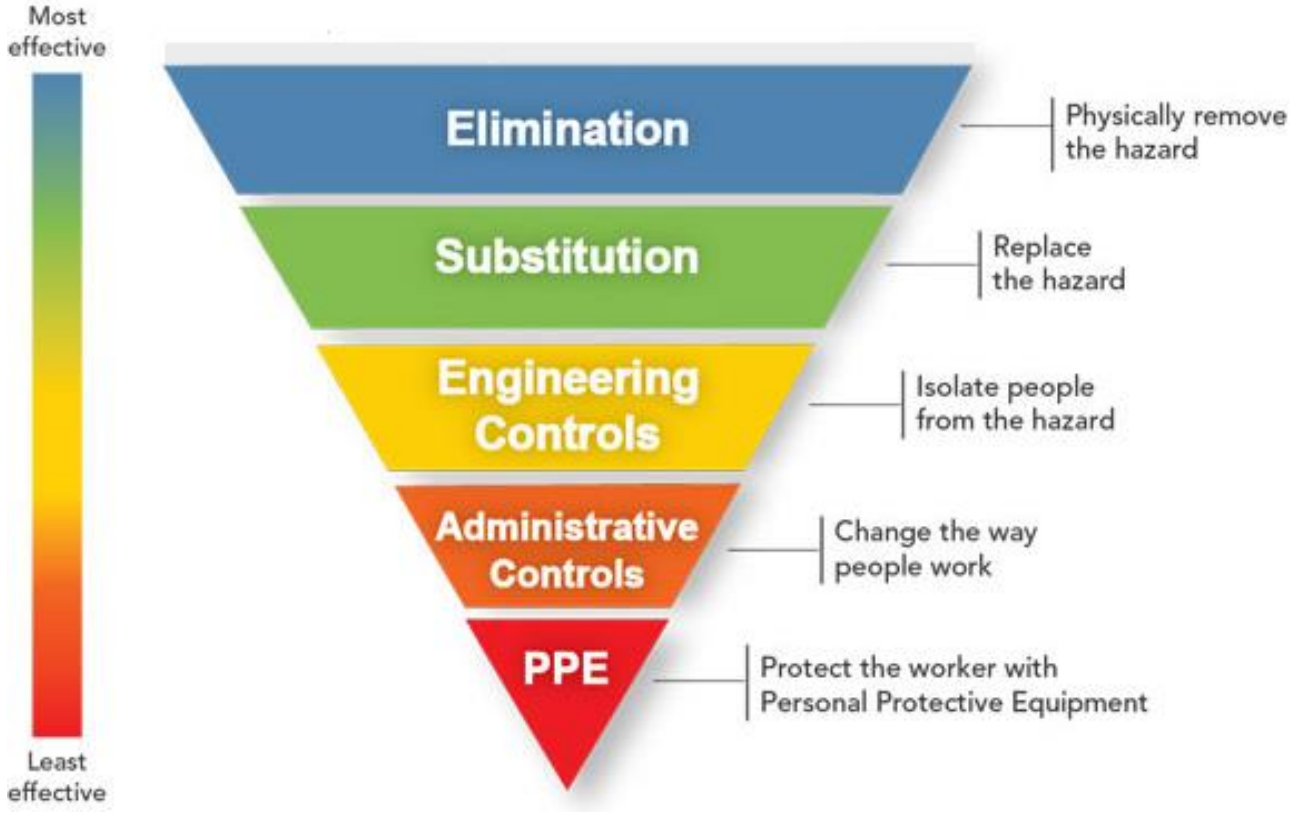
Table-4: Risk Levels

Risk reduction/minimization involves various loss control strategies aimed at limiting the potential consequences or frequency of a given risk without totally accepting or avoiding the risk. Strategies should include staff training & awareness, policy and procedure revision and other interventions aimed at controlling adverse occurrences without completely eliminating risk activities.

4.3.1 Hierarchy of Control

Risk reduction process must address the means of providing a solution in the following order:

- Eliminate the risk by removing the hazard – 'engineer out' the problem at source.
- Reduce the risk by substitution of a less hazardous process, activity or substance.
- Isolate (protect everyone) by effective engineering control such as enclosing the hazard, removing the person from the hazard or reducing the person's exposure time to hazard.
- Install protective devices.
- Provide proper supervision, supported by training, instruction and relevant information.



Hierarchy Control - Risk Reduction Process Flow

4.3.2 Key Information to Remember on Risk Management

- Risk is defined as the chance or probability of occurrence of an injury, loss, or a hazard or potential hazard.
- Risk assessment is the process of assessing the risks associated with each identified hazard, in order to make decisions and implement appropriate control measures to prevent the hazard from occurring.
- Hazard is a condition with the potential to cause injury, illness, or death of personnel; damage to or loss of equipment or property; or mission degradation.
- Hazard identification is the process of examining each work area to identify the hazards associated with each job or task.
- Probability is defined as the likelihood that a given event will occur.
- Severity is defined as the degree of undesired consequences.
- The five basic steps in the risk management process are *hazard identification*, *hazard assessment*, *development of controls and decision making*, *implementation*, and *supervision and evaluation.*

- The types of controls can take many forms, but fall into three main categories: *educational controls*, *physical controls*, and *avoidance*.
- A key element in developing and implementing control measures is to specify who, what, when, where, why and how each control is to be used.
- A key element of the risk decision is determining if the risk is justified.
- The critical check for controls implementation, with oversight, is to ensure that controls are converted into clear, simple instructions understood at all levels.

4.4 Record and Review

It is a key part of this procedure that risk assessments must be recorded. The record serves as evidence that the risk has been identified and evaluated and provides the information necessary to review progress accurately over time to see if the risk has been reduced.

Consider below recommendations for continual improvement of Hazard Identification & Risk Assessment methodology:

- Have there been any significant changes?
- Are new hazards introducing new risks, and if yes, what are the likelihood and severity of harmful events?
- What are the priorities of new risks?
- Are there changes to the priorities of known risks?
- Are there improvements you still need to make?
- Have your workers spotted a problem?
- Are existing control methods for known risks still effective?
- Have you learnt anything from accidents or near misses?
- Make sure your risk assessment stays up to date

This procedure should be reviewed when significant changes occur to EEPL operations.

HSE Audits shall be carried out in accordance with standard operating procedure in order to ensure the compliance of the controls determined and conformance with the standards. (HSE Audits as per HSE Auditing Procedure in policy element # 10 Auditing & Review).

HSE Audit reports regarding observed non-compliances are submitted to concerned HSE representative and Project Manager for implementation accordingly. Follow-up HSE audit is used to ensure the implementation of recommended corrective actions of the previous reports.

5.0 References

- Management of Health and Safety at Work Regulations.
- ISO 45001:2018 HSEMS
- Health and Safety Executive – UK
- Occupational Safety & Health Administration (OSHA) USA
- ADNOC – HSE Management System

6.0 Attached Documents

- HSE-FRM-002 - Job Safety Analysis
- HSE-FRM-003 - Task Risk Assessment
- HSE-FRM-004 - Hazard Register

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

HSE TRAINING, AWARENESS AND COMPETENCY

Prepared and Issued by

SABQ Energy Contracting Group

Contents

Introduction

1.0 Purpose

This procedure describes the guidelines to determine the level of experience, competence and training necessary to ensure the capability of personnel, especially those carrying out specialized HSE functions / responsibility.

1.1 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of Elite Engineering Private Limited. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

IMS: An **Integrated Management System** (IMS) integrates all of an organization's systems and processes in to one complete framework, enabling an organization to work as a single unit with unified objectives. An example of an integrated management system is one that simultaneously handles the requirements of ISO 45001, OHS standard; and ISO 14001, the environmental management system standard.

OJT: On-the-job training (OJT) is training that is delivered while an individual is performing tasks or processes related to their particular occupation. The employee typically performs tasks that are essential to their job function with the supervision of a manager, coach or mentor. This type of training is typically used to broaden an employee's skill set and to increase productivity.

SAT: The **Systematic Approach to Training** is a methodology for managing training programs. It is an orderly, logical approach to determine what people must know and do at a particular job or in a specific profession. Sat begins with identifying people's work related needs.

Competent Person: Competent worker can be described as a person who possesses a combination of training, skills, experience and knowledge and his/her ability to apply them to perform a task safely**.** Other factors, such as attitude and physical ability, can also affect someone's competence.

Proactive Approach: To ensure that HSE standards are correct in the workplace before any accident, incident or ill health is caused. The intention is to identify any conformance for recognition of good performance and any non-conformance to rectify the cause of it. Examples are inspections, surveys, benchmarking, health surveillance etc.

Reasonably Practicable: It means that which is, or was at a particular time, **reasonably** able to be done to ensure health and safety, taking into account and weighing up all relevant

matters including: (a) the likelihood of the hazard or the risk concerned occurring (b) degree of harm (c) Person involved etc.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.

- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.
- Shall be responsible to ensure that hiring and placement plans will not result in dilution of experience for critical HSE activities and functions.

4.0 Procedure

This procedure shall be established and maintained to identify training needs and provide the training and awareness of all personnel performing activities that may create significant impact on health, safety and environment in the workplace.

Formal or on-the-job training shall be provided to fulfill the needs of the post in order to achieve improvement and correct deficiencies.

Personnel performing specific assigned tasks shall be qualified and competent on the basis of appropriate education, training and/or experience, as required.

Records of training shall be maintained and reviewed on a scheduled basis as per the established procedure.

Training procedures shall take into account differing levels of responsibility, ability, literacy and risk. Competency shall be determined in terms of appropriate education, training and/or experience.

All HSE-critical operations and activities shall have defined and recorded competency levels which shall be periodically reviewed and improved where possible.

All personnel who perform HSE-critical activities shall be appropriately experienced/qualified and trained to ensure they are competent to undertake important risk control measures.

4.1 Training

SABQ having safety critical functions training department is used to address defined requirements. Systematic Approach to Training (SAT) process shall be used as a tool over other conventional training processes through a quality assurance process that ensures the competence of staff. The SAT process encompasses the following steps:

- Analysis of training needs and the competencies required to perform a given job though Task Assessment.
- The design of training to meet these needs, which involves converting the competence requirements into training objectives including identification of appropriate training tools and settings.

- The development of training materials and tools such that all objectives can be met, as well as the training of trainers.
- The implementation of training according to the procedures and materials developed e.g. training can be implemented in the classroom, workshop, simulator, by self-study or on-the-job training.
- The evaluation of training effectiveness during and at the conclusion of training;
- Feedback of evaluation results into the relevant phases and parts of the training process and program.

4.1.1 Identification of Training Needs

Identification of HSE Management System training needs for all employees (managerial/non managerial staff) is the primary responsibility of the Corporate HSE department.

Thereafter, identifying training needs of project staff is the responsibility of the respective Site Manager / Site HSE Lead, via the staff appraisal programs.

Identification of training needs is based upon:

- Defined roles and responsibility.
- Risk associated with the job/task.
- Job hazard analysis.
- Incident/Injury/near Miss records.
- Complexity and sensitivity of the task.
- Impact of the task on organization.
- Performance appraisal.
- Repetitiveness of the task.
- Employee suggestion.

Special training attention shall be given to staff with responsibility for emergency handling and for monitoring and measuring activities of the HSE Management System.

The needs of job posts should be assessed regularly by the HR-Admin Manager / Site Managers / Team Leaders and compared against the post holder's competency and experience to determine training and development needs and changes to the limits discretion.

4.1.2 Training Management System

SABQ shall establish training function that is responsible for the following training activities:

- Coordinating training, including that provided by any in-house trainers or external bodies.
- Leading the development and implementation of all training across the organization.

- Providing a program for training and qualification for all personnel responsible for instructing or training others. ("Training the Trainer").
- Providing quality assurance of training from internal and external sources.
- Leading the overall training evaluation and feedback process with support from line departments.
- Providing a periodic report to the business with feedback on the results of the evaluation of training programs and training process improvements.
- Ensuring adequate training records are maintained by regular audit.
- Defining job, role or task specific training needs.
- Monitoring the effectiveness of training programs being run across the organization.

4.1.3 HSE Training Program

HSE Management System training program requirements are identified by Corporate HSE function and coordinated by HR-Admin function.

The criteria for the effectiveness of the HSE training program are as follow:

- The extent of the implementation of the training program highlighting significant deficiencies/shortcomings.
- The quality and the relevance of the formal training courses.
- The quality of course presentation.

The general requirements of training are:

- The HR-Admin / HSE / Site Managers / Team Leaders shall be responsible for ensuring the implementation of the HSE Training Program **(Annexure A: HSE Training Matrix)** and that all personnel are trained to the appropriate level as outlined in the training standard.

- Evaluate and analyze training reports and ensure level of training is commensurate with risk levels;
- Produce a plan from the analysis to fill any 'gaps' identified in a training course, in consultation with the HR-Admin / Corporate HSE.
- Provision of training records (HSE Training Record, HSE-FRM-008).

HSE training for HSE Staff:

HSE staff shall receive formal training in all aspects of HSE management system. In addition to the standard training given, the HSE Management System Representative shall receive advanced training in loss control and/or safety management techniques.

On-the-Job training for all employees:

OJT training relates principles and theories to work skills applied in the work environment. OJT is designed to reinforce formal training. All new-hire/transferred employees require training to perform their jobs effectively. In this regard, OJT is an essential supplement to

formal training. OJT assignments may be provided concurrently with formal training to emphasize and complement material covered in formal training courses. Time allotted to accomplish OJT assignments should be compatible with the new hire's current knowledge, skill, and experience levels. The employee's supervisor should assess the employee's ability to successfully complete OJT training.

Periodic HSE Trainings:

At some worksites, complex work practices are necessary to control hazards. Elsewhere, occupational injuries and illness are common. At such sites, HSE function shall ensure that employees receive periodic HSE training to refresh their knowledge of controlling hazards/risks involved in operational activities. New training will also be conducted as necessary when Integrated Management System, International Standards, change or new standards are issued.

Where the work situation changes rapidly, weekly meetings will be conducted as needed. These meetings will remind employees/workers of the upcoming week's tasks, the environmental changes that may affect them, and the procedures they may need to protect themselves and others.

Identifying Types of Training:

Specific hazards/risks that employees need to know about should be identified through total site health and safety surveys, job hazard analysis, and change analysis. Accident and injury records may reveal additional hazards and needs for training. Near-miss reports, maintenance requests, and employee suggestions may uncover still other hazards requiring employee training.

4.1.4 Monitoring of HSE Training Program

Monitoring the employee's progress through the developmental period is critical to ensure success of the training program. Monitoring provides information to the supervisor regarding the benefits and effectiveness of the training received. In addition, it provides information on the ability of the employee to achieve training goals and objectives. Both the employee's supervisor and training staff play major roles in the monitoring process.

To ensure adequate monitoring of the HSE training program the actions below must occur:

- The HR-Admin / HSE function will ensure that each employee has completed the necessary prerequisites before the start of work.
- The supervisor will review the employee's performance of task assignments.
- The HR-Admin / Supervisor will conduct a review with the new-hire/transferred employee following each required training activity. This review provides the supervisor with information on the progress of the employee and can assist in identifying areas requiring further training.

- When the supervisor determines that the new-hire/transferred employee has sufficient experience to successfully complete a task, performance monitoring of employee will start.

4.1.5 Evaluation of HSE Training Program

An evaluation of the effectiveness of the training program will be conducted periodically. Staff from the training department will interview managers, supervisors and employees who have participated in the program to determine the effectiveness of the training, and to obtain suggestions for program improvement.

Evaluation will help determine whether the training provided has achieved its goal of improving employee safety and performance. When carefully developed and carried out, the evaluation will highlight training program strengths and identify areas of weakness that need change or improvement.

- Evaluation will include analysis of employee attendance at training sessions. Training will not work for an employee who does not show up. Absenteeism can signal a problem with the worker, but it can also indicate a weakness in training content and presentation.

- Corporate HSE will compare pre-and post-training injury and accident rates overall. The periods of time being compared must be long enough to allow significant differences to emerge if training has made a difference.

- Corporate HSE will determine whether the training provided has achieved its goal of improving employee safety performance. Evaluation will highlight training program strengths and identify areas of weakness that need change or improvement.

4.1.6 Review of HSE Training Program

The Corporate HSE function shall review the Training Program annually by means of the following:

- A review of all occupations to identify if new jobs have been developed.
- A review of the SABQ operational activities are undertaken against the identified occupations and associated risks.
- A review of training as a result of accidents, near misses or non-conformance.
- A review of training as a result of changes to operating operational conditions.
- A review of training identified as result of changing legislation.
- A review of critical segments of the training program to identify any refresher training requirements.

4.2 Awareness

This Procedure shall be established and maintained to ensure that employees working at each relevant function and level are:

- Aware of HSE risks & impacts relevant to their workplace and activities.
- Given high awareness of the actual or potential consequences of their work activities and personal performance.
- The importance of conforming to the policy, procedures and requirements of the HSE Management System.
- Aware of their roles and responsibilities in achieving conformance to the HSE policy and procedures, and the requirements of the HSEMS, including emergency preparedness and response requirements.
- The potential consequences of departing from specified operating procedures.
- Informed of the benefits of improved personal performance.

4.2.1 Awareness of HSE Management System

The framework of Health, Safety and Environmental Management System (HSEMS) shall outline structured mechanism that needs to be put in place for effectively managing HSE throughout the company. It shall act as a governing guide to system giving elaborate details to be adhered not only to comply with requirements of the standard in true spirit but also be safeguarding **People, Asset, Environment** and **Reputation** of the organization proactively in a systematic manner.

SABQ HSEMS shall stand through **12 Policy Elements** giving specific objectives and expectations that must be met while planning, managing/executing, monitoring and evaluating and specific activity including the day to day operations of the company.

The HSE Management System framework is derived from prevailing international standards and industry best practices worldwide for managing Health, Safety and Environment (e.g. ISO 45001, ISO 14001 etc.). The anatomy of framework based on the firm foundational principle of **"leadership and commitment"** reflecting the cyclical ISO system of continual improvement following the **"Plan, do, check, act"** PDCA process.

The training program and other campaigns shall be structured to emphasize effective awareness of HSE management System amongst all SABQ employees at any project site, workshop and head office.

4.2.2 Awareness of HSE-MS Roles & Responsibilities

New or transferred employee will receive initial formal HSE induction on the day of arrival/joining by HSE function and job orientation by his immediate Line Manager over the period of the inductee's first trip.

This orientation shall describe the general awareness about the HSE management System and inductee's roles and responsibilities for HSEMS:

- Company's overview/introduction
- Company's HSE policy
- Company's HSE management System policy elements
- Emergency response procedure
- Fire prevention and fighting procedure
- First aid facility
- HSE hazard awareness and reporting
- General rules and procedures
- Occupational health and hygiene
- Work permit systems

4.2.3 Awareness of HSE Risks in Work Activities

Employees whose work activities are associated with HSE risks are made very aware of this by their respective Line Managers, Supervisors and HSE representatives. For all such employees comprehensive HSE training matrix with identified trainings related to their work activities shall be carried out as per requirements described in this procedure.

4.3 Competence

Competence is initially assured by the selection and recruitment process, and thereafter by the **Functional Managers** during annual appraisal.

Where the need is identified, evaluate the competency of individuals by means of questionnaires, interviews and assessments. The purpose of the competency check is to identify individuals that require additional training and coaching to develop the necessary skills to carry out their specified duties.

A Competence Management system should be fully integrated within an organization if it is to address compliance issues, improve business performance and protect the health and safety of its employees, suppliers, contractors, customers and the general public. It should also protect the Environment.

Developing competence will not in itself guarantee safety, but it will help reduce the risks to levels that are as low as reasonably practicable (ALARP).

People may currently be competent, but they do not necessarily retain a satisfactory level of competence over time without periodic application of the competence supported by formal training, on-the-job training, or appropriate refresher training especially where such skills cannot be practical routinely tested i.e. in emergency response situations.

Good communication is crucial for the effective operation of a Competency Management System. In addition, special communication channels may need to be established for those not directly employed by the organization such assist subcontractors.

Competency Management should be supported by a Competency Framework which typically consists of three levels. The first level usually covers competency categories which lead to a second level of competency groupings within each category. The final tier covers specific competencies and is where the performance criteria are identified. To assist in the management of this process it is suggested that the Competency Framework is supported by an appropriate Skills Assessment and Training Requirements database.

An organization's Competency Framework should reflect both the industry and business objectives. Where the first tier competency categories include Human Factors then the second tier groups are likely to include:

- Communication skills
- People management
- Customer service skills
- Team skills
- Leadership / decision making skills
- Problem solving
- Performance management
- Technical skill

4.3.1 Hiring and Placement

Internal and external recruitment and staff appointments shall be carried out in accordance with the HR-Admin Personnel Policies.

HR-Admin shall ensure that the hiring and placement process for critical HSE activities and functions having impacts on HSE is carried out in such a way that the Business Unit will not suffer from dilution of experience.

All employees will be required to acknowledge receipt and acceptance of the terms and conditions of employment with special emphasis on safety, health and environmental aspects.

4.3.2 Selection Criteria

Criteria for selection and competency should reflect the basic physical suitability, knowledge and skills appropriate to the activities of the post.

SABQ will follow a formal selection, hiring and placement process for all new personnel or those changing jobs which will address:

- Company Personnel Policy.
- Necessary physical and skills /competency requirements.
- Qualifications and experience.
- References and verification of qualifications and experience.

4.3.3 HSE Competency Assessment

HSE Competency of the workers shall be assessed by a systematic approach using HSE Competency Framework. The framework enables the company in improving OH&S performance by creating and maintaining a safety culture that presents a clear way forward for the company by promoting a consistent standards to improve OH&S competency for different departments of the company.

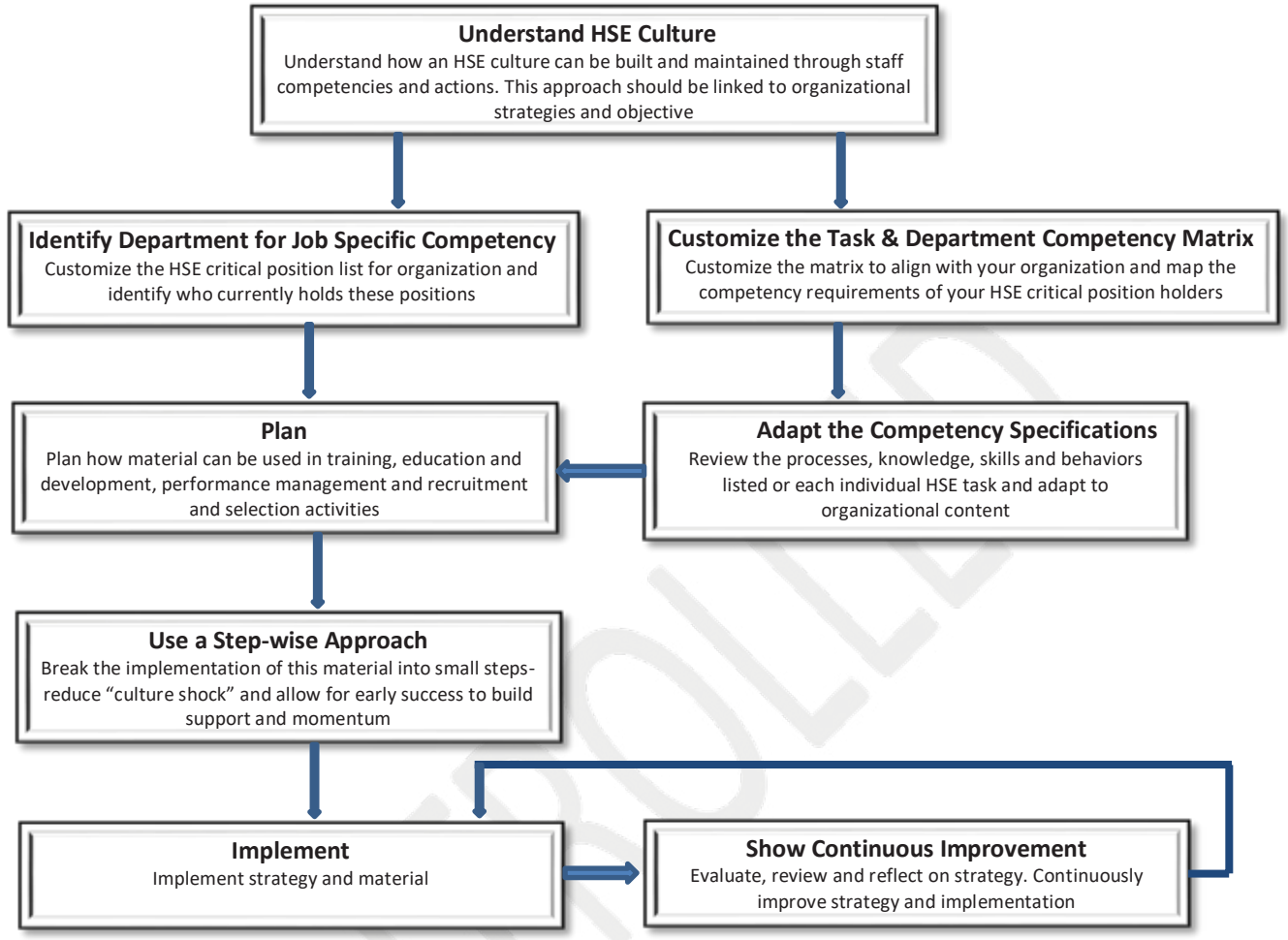
HSE Competency Framework provides the information required particularly for senior managers of all the departments to implement the HSE requirements to create a positive safety culture that suit SABQ organizational requirements.

The competency assessment framework does this by identifying "who needs to be able to do what". In the terminology of the framework, this means identifying the "concerned departments" and the "related procedures" that those departments need to perform competently and effectively. Once customized, the framework should then be linked to existing SABQ management system and HSE management plans to achieve an improvement in culture and performance.

HSE Competency Framework Structure

The stages of HSE Competency Framework are provided below:

- Developing a positive safety culture.
- Identifying activities/procedures and concerned departments.
- Defining competency requirements: The Task and Department Competency Matrix **(Annexure B)**.
- Integrating the framework.
- Competency in implementing procedures and positive culture outcomes to be achieved.



HSE Competency Framework

5.0 References

- Management of Health and Safety at Work Regulations
- ISO 45001:2018 OHS
- ISO 14001:2015 EMS
- Health and Safety Executive – UK
- Occupational Safety & Health Administration (OSHA) USA
- ADNOC – HSE Management System Guidelines

6.0 Attached Documents

- Annexure-A: HSE Training Matrix
- Annexure-B: HSE Competence Assessment
- HSE-FRM-008: HSE Training Record

Annexure A; HSE-SOP-006; REV: 00; 04-07-2024

HSE Training Matrix

Sr. No	Required Departments / Trainings Need Assessment	Project Management and Execution	HR & Admin	Marketing & Proposal	QA/QC	HSE	Design and Engineering	Business Development	Finance and Accounts	Supply Chain	Workshop and Warehouse
1	First Aid	R	R	R	R	R	R	R	R	R	R
2	Confined Space	R			R	R					R
3	Scaffolding Erection & inspection	R			R	R					
4	Lifting Operation	R				R					R
5	Defensive Driving	R	R	R	R	R	R	R	R	R	R
6	Manual Handling and Ergonomics	R	R	R	R	R	R	R	R	R	R
7	HSE Leadership	R	R	R	R	R	R	R	R	R	R
8	Power, hand tools safety	R			R	R					R
9	Fire Fighting	R				R					R
10	Work at Height	R			R	R					
11	Permit to work	R			R	R					R
12	Emergency Response Plan	R	R	R	R	R	R	R	R	R	R
13	Environmental Management System	R	R		R	R					R
14	Radiography Hazards and Controls	R			R	R					R
15	JSA and Risk Assessment	R			R	R					R
16	Near Miss Reporting	R	R	R	R	R	R	R	R	R	R
17	Chemical Fumes Hazards and Controls	R			R	R					R
18	Waste Management System	R	R			R					R
19	Health and Hygiene	R	R	R	R	R	R	R	R	R	R
20	Hydro testing Hazards and controls	R			R	R					R
21	Noise and Dust Exposure	R			R	R					R
22	Painting Hazards and controls	R			R	R					R
23	Gas Cutting, Grinding, Welding	R			R	R					R
24	Sandblasting	R			R	R					R
25	Electrical Hazards and Safety Precautions	R			R	R					R
26	Gas Cylinder and Safe Handling	R				R					R
27	Behavior Base Safety	R	R	R	R	R	R	R	R	R	R
28	Fire Prevention and Protection	R	R	R	R	R	R	R	R	R	R
29	HSE Management System	R	R		R	R					R
30	ISO 45001 OH&S	R	R		R	R					R

Legend	
R	Training Required

Approved By:

Signature:
Date:

Corporate HSE Manager

Annexure B; HSE-SOP-006; REV: 00; 04-07-2024

HSE Competency Assessment

Policy Element	Task/Respective Standard Operating Procedure	Department									
		Project Management and Execution	HR & Admin	Marketing & Proposal	QA/QC	HSE	Design and Engineering	Business Development	Finance and Accounts	Supply Chain	Store and Warehouse
Leadership and Commitment	HSE Organization, Structure, Goal and Objectives	a	a	b	a	a	b	b	b	b	b
Organizational Structure	Project HSE Organization	a	a	b	b	a	b	b	b	b	b
Risk Assessment and Management	Hazard Identification and Risk Assessment	a	a	b	a	a	a	b	b	b	b
	Environmental Aspect Identification and Impact Assessment	a	b	b	a	a	b	b	b	b	b
	Control of Substance Hazardous to Health	a			a	a	b			b	a
People Competency and Behavior	HSE Training, Awareness and Competency	a	a	b	a	a	b	b	b	b	a
Information and Communication	HSE Orientation and Communication	a	a	b	a	a	b	b	b	b	a
	HSE Sign Boards	a	b	b	a	a	b	b	b	b	a
	Horseplay and Substance Abuse	a	a	b	b	a	b	b	b	b	b
Operations, Planning and Management	Logistics and Transportation Safety	a	a	b	b	a	b	b	b	b	a
	Permit to Work System	a	b	b	a	a	a	b	b	b	b
	Working at height	a	b	b	a	a	b	b	b	b	a
	Working in Confined Space	a	b	b	a	a	b	b	b	b	b
	Rigging and Lifting Activity	a	b	b	a	a	b	b	b	b	a
	Scaffolding	a	b	b	a	a	b	b	b	b	b
	Radiography	a	b	b	a	a	b	b	b	b	a
	Waste Management	a	b	b	b	a	b	b	b	b	a
	Electrical Safety	a	b	b	a	a	b	b	b	b	a
	Fire Prevention and Protection	a	a	a	a	a	a	a	a	a	a
	Hands and Power Tools	a	b	b	a	a	b	b	b	b	b
	Excavation Safety	a	b	b	a	a	b	b	b	b	b
	Handling of Gas Cylinders	a	b	b	b	a	b	b	b	b	a
	Personal Protective Equipment	a	a	b	a	a	b	b	b	b	a
	H2S Safety	a	b	b	a	a	b	b	b	b	a
	Manual Handling	a	a	a	a	a	a	a	a	a	a
	Office Safety	a	a	a	a	a	a	a	a	a	a
	Ergonomics	a	a	a	a	a	a	a	a	a	a
	Pressure Testing	a	b	b	a	a	b	b	b	b	b
	Painting and Coating	a	b	b	a	a	b	b	b	b	a
	Cutting, Welding & Grinding	a	b	b	a	a	b	b	b	b	a
	Compressed Air and Sand Blasting	a	b	b	a	a	b	b	b	b	a
	Insulation	a	b	b	a	a	b	b	b	b	a
	Health and Hygiene	a	a	a	a	a	a	a	a	a	a
Contractor Services and Management	Contractor HSE Management	a	b	b	b	a	b	b	b	a	b
Emergency Preparedness and Management	Emergency Response Plan	a	a	a	a	a	a	a	a	a	a
	Site Security Management	a	a	b	b	a	b	b	b	b	b
Performance Evaluation and Monitoring	HSE Performance Management	a	a	b	b	a	b	b	b	b	b
	Environment Aspect Monitoring and Control	a	b	b	a	a	b	b	b	b	a
	Legal and Other Requirements	a	a	b	b	a	b	b	b	b	b
Audit and Review	HSE Auditing	a	b	b	a	a	b	b	b	b	b
Incident Investigation and Analysis	Incident/Accident Reporting and Investigation	a	a	b	a	a	b	b	b	b	b

Legend:		
	a	Full understanding required
	b	Working knowledge and awareness required

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

PERMIT TO WORK (PTW) SYSTEM

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

This procedure aims to provide a consistent, transparent, and auditable approach to the management of activities that require a permit to work. The fundamental aim of this procedure is to take all practicable steps to promote personnel safety, safeguard human assets, property, and the environment, and conserve material resources. As part of this policy, SABQ has committed effort and resources to develop and enforce safe working practices and to ensure that all non-routine work performed is controlled by a Permit to Work System.

1.2 Scope

This document shall be applicable to the head office, workshop, shutdowns, and all the project sites and construction activities of SABQ Energy Contracting Group Co. Ltd. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

AGT: Authorized Gas Tester

CSA: Confined Space Attendant

CoW: Control of Work

CSEP: Confined Space Entry Permit

CWP: Cold Work Permit

EWP: Excavation Work Permit

FWM: Fire Watch Man

HLP: Heavy Lifting Permit

HWP: Hot Work Permit

LOTO: Log out Tag out

RWP: Radiography Work Permit

SWP: Safe Work Plan

VEP: Vehicle Entry Permit

Area Authority: are responsible for the day-to-day management of the Permit to Work process within their defined area. The area authority is normally the facility manager, project manager, site manager, or equivalent, although any individual can be assigned this role. There can be more than one area authority at the site or premises.

Blinding: A blind flange is a plate for covering or closing the end of a pipe. A flange joint is a connection of pipes where the connecting pieces have flanges by which the parts are bolted together. The process of putting a blind flange in a line to isolate it is called blinding.

Classification of Hazardous Area: In industry, with the exception of mining, areas that are hazardous, so far as flammable gases and vapors are concerned, are classified according to the probability of the occurrence of explosive concentrations of gas or vapor.

These classifications, called zones, are as follows:

Zone 0 is a zone in which a flammable atmosphere is continuously present or for long periods.

Zone 1 is a zone in which a flammable atmosphere is likely to occur in normal work.

Zone 2 is a zone in which a flammable atmosphere is unlikely to occur except under abnormal conditions and then only for a short time.

The particular zone determines the types of protection required for electrical equipment in use in that zone, although ideally, the prime method of protection should be to exclude electrical apparatus from any hazardous area.

Isolation: Isolation is a process that stops the flow of process media to a given location. This could be electrical or mechanical isolation, usually done for safety during maintenance activities.

Issuing Authority: The issuing authority may be the lead technician, senior supervisor, or area engineer responsible for normal operations within a particular discipline. The issuing authority shall be an individual with additional training and understanding of safe practices.

Non-routine Activity: A non-routine activity or task is an activity or set of activities that are not generally performed on a routine basis or that are performed other than the regular activities of operation.

Performing Authority: This includes a job supervisor or engineer who is directly leading the particular job and supervising the workers performing that job.

Permit to Work (PTW): A permit to work system is a system of formal documentation that identifies the work to be done, the hazards involved, and the precautions to be taken. It ensures that all hazards and precautions have been considered before work begins. Permits are used for controlling and coordinating work to establish and maintain safe working conditions.

Purging: Purging is the act of removing the contents of a pipe or container and replacing it with another gas or liquid. Purging is crucial in pipelines, piping, welding, and industrial processes. Purging can prevent a hazardous mixture of gas and air. When a newly constructed natural gas pipeline is put into service, it can be safely purged of air by the injection of a slug of inert gas, such as N_2.

SIMOPS: "Simultaneous Operations." It is any situation where two different activities are occurring close enough to each other that there is a risk of interference, clashing, or risk transfer that enhances the probability of an unwanted event happening.

Volatile Organic Compound (VOC): Volatile organic compounds (**VOC**) mean any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, that participates in atmospheric photochemical reactions, except those

designated by the EPA as having negligible photochemical reactivity. Examples of VOCs are benzene, ethylene glycol, formaldehyde, methylene chloride, etc.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be the owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshops.
- integrate good health, safety, and environmental management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety, and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager, Site Manager, or Works Manager

- They will be responsible for the implementation of this procedure according to all the details given in it, wherever they are applicable in their areas of influence.
- It will be responsible for a new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible for ensuring the availability of all resources required for compliance with the details given in this procedure.
- It will be responsible to allow the personnel to attend the necessary training without compromising HSE-critical activities.
- Reviews and approves procurement requisitions; carries out checks and inspections to ensure that delivered goods used for confined space are of good quality with respect to health and safety.
- She will be responsible for ensuring that accidents are reported, investigated, and corrective and preventive measures are taken.

3.3 Corporate HSE Manager

- will be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.

- will be responsible for ensuring that individual supplementary trainings are identified and implemented
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Site Lead HR-Admin

- They will be responsible for the implementation of this procedure according to all the details given in it, wherever they are applicable in their areas of influence.
- will be responsible for resourcing any internal or external training needs identified by the IMS requirements.
- They will be responsible for ensuring that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Representative

- will be responsible for communicating the requirements laid down in this recommendation to all employees and contractors.
- will be responsible for performing on-site PTW inspections, audits, and checks.
- She will be responsible for monitoring and tracking the close-out action items generated as a result of PTW audits and inspections.
- will be responsible for delivering PTW System training to all relevant employees and contractors.
- will be responsible for providing PTW training to site new employees and contractors, including refresher training for all site personnel.
- will be responsible for keeping the list of authorized PTW personnel up-to-date.

3.6 Issuing Authority (Originator)

Work permits shall only be issued by an SABQ-authorized issuing authority. Issuing authorities will be selected from shift supervisors and above. The **issuing authority** shall be responsible for:

- Full understanding of the nature of the work. If the issuing authority has limited knowledge of the work to be undertaken, missing knowledge on technical aspects of the work will need to be obtained from the performing authority.
- Identifying all the hazards associated with the job.
- Confirms that all the necessary precautions, including isolations, are in place before work begins.
- Ensures the correct issue and suspension of work permits in the area under his control.

- Ensure that work may proceed safely within the terms of the work permit.
- Ensures that the appropriate performing authority fully understands the requirements of the work permit.
- Inform all relevant personnel about the work permit that has to be issued.
- Ensures that interacting jobs are identified and cross-referenced.
- Ensuring that all people who may be affected by the work are informed before the work begins, when the work is suspended, and when the work is completed.
- Ensures that effective arrangements are made for the work site to be examined before work begins, on completion of work, and as appropriate when work is suspended.
- Ensures that all required operational actions and conditions have been carried out, including drainage, isolation, purging, blinding, etc.
- Ensures that the necessary flammable and toxic gas tests have been specified and carried out.
- Describing the right PPE's.
- Ensures that all safety measures have been applied.
- Exercise daily follow-up on the work sites.
- Confirms when a work permit is not required.
- Ensuring that handovers from shift to shift are effective.

3.7 Performing Authority (Task Supervisor)

Performing authorities are any personnel approved by SABQ Execution and HR as being competent to supervise. The **Performing Authority** shall be responsible for:

- Initiate the permit and identify the hazards and control measures for the task being planned.
- Participate in any risk assessment or job safety analysis where required.
- Hold tool box meetings as necessary to ensure that all other persons involved in the task fully understand the scope of the work, the identified hazards, and associated controls (and ensure that all participants in the task sign off on the worksite hard copy of the permit).
- Provide the culture to "stop the job" if anyone feels unsafe or uncertain about any aspect of the task.
- Ensure that only personnel authorized by the permit participate in the work and that no unauthorized interference takes place.
- Ensure that if there are any changes to the initial permit conditions, the work is stopped and reassessed. (Note: these include both changes in the work scope and conditions at the work site.).
- Report and interact regularly with the area authority and issuing authority on any issues to ensure risks from all hazards continue to be mitigated by controls as low as reasonably practicable (ALARP).
- Ensuring full involvement in the work preparation process.
- Ensures that all precautions are maintained throughout the activity.

- Ensure that any agreed-upon supplementary controls are recorded on the permit and applied.
- Ensure that only work covered within the permit scope takes place.
- Ensure that lessons learned from the job are captured.
- Ensure that the worksite is kept in a clean and safe condition both during and upon completion of the job.
- Ensure adequate handovers take place at shift and crew change periods with the oncoming performing and area authorities.

3.8 Area Authority (Area Operator)

The area authority provides a link between the work that has been completed and the area where the work is being completed. The **Area Authority** shall be responsible for:

- Have overall responsibility for the safe control of non-routine work activities within their defined area in accordance with the Permit to Work system, including the issue of all work permits and associated certificates.
- Ensure the appropriate level of risk assessment has been carried out for the task.
- Liaise closely with the Performing Authority when planning permits to ensure that appropriate controls are identified for each identified hazard.
- Confirms that the precautions are maintained throughout the activity.
- Ensure all the agreed control measures are in place; confirm that the Performing Authority fully understands the scope of the task and that other members of the work party have been fully briefed via a safety Toolbox Talk or equivalent means of communication.
- Provide the culture to “stop the job” if anyone feels unsafe or uncertain about any aspect of the task.
- Approve isolation design, control isolation implementation, and ensure the agreed isolations are in place prior to allowing an associated permit to be issued.
- Ensure that the isolations are properly removed after the completion of the work and the cancellation of the permit.
- Ensures that safe and proper tools are used and that the people executing the work are competent.
- Ensure that worksite inspections are carried out before, during, and after the performance of each task (some of this task may be delegated to a competent direct report).
- Ensure that adequate handovers take place at shift change, crew change, or other change-out/over of area authorities, performing authorities, and isolation authorities.

3.9 Authorized Gas Tester (AGT)

Authorization shall be made on **"HSE-FRM-029." AGT** shall be responsible for the following:

- Shall minimally test for the presence of flammable vapors, toxic gases, and oxygen prior to and during work covered by a Hot Work or Confined Space Entry Permit, where applicable.
- When it is determined that volatile organic compounds (VOC's) or other toxic agents may be present, the performing authority or AGT shall notify the issuing authority and area authority, and consultation with the site HSE lead and/or client representative shall be initiated.
- AGTs shall be trained on the specific monitor in use and must understand the limitations of the devices that they are using.
- The gas tests are done before work starts and at the frequency stated on the permit.
- The results of the gas testing are recorded and entered on the Permit and Confined Space Entry Permit (HSE-FRM-026).

3.10 Confined Space Attendant (CSA)

Authorization shall be made on **"HSE-FRM-027."** All confined space attendants:

- Shall be adequately qualified via SABQ Hole Watch training and follow-up supervisor-directed training on the job.
- It will be your responsibility to know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- It will be responsible to know the possible hazard exposure behavior effects that may be experienced by the authorized entrants.
- It will be responsible to continuously maintain an accurate count of authorized entrants in the confined space and ensure that the means used to identify authorized entrants accurately identify who is in the confined space.
- Shall be responsible for remaining outside the confined space during entry operations until relieved by another attendant. (Note: When the employer's permit entry program allows attendant entry for rescue, attendants may enter a confined space to attempt a rescue if they have been trained and equipped for rescue operations and if they have been relieved by another attendant.).
- It will be responsible to establish and maintain continuous contact (visually, verbally, by whistle, tagline, etc.) with entrants. This contact is required to monitor entrant status and alert entrants of the need to evaluate the space.
- It shall be responsible to summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from confined

space hazards. The communication shell will be made, which will be in direct contact with the site manager, HSE manager, and site rescue team.

- It shall be responsible to monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and to order the authorized entrants to evacuate the confined space immediately.

3.11 Fire Watch Man (FWM)

Authorization shall be made on **"HSE-FRM-030." FWM** has the following responsibilities:

- Flammable materials have been cleared away from the work area.
- Sparks and welding spatter are contained by the use of fire blankets.
- Firefighting equipment is available and ready for immediate use.
- Knowing the emergency plan and procedure.
- Should know how to operate and use fire extinguishers.
- The alarm is sounded immediately, and work is suspended when a fire or gas release occurs in the area.
- The work site is monitored for 30 minutes after hot work stops.
- Having emergency contact numbers or the nearest location of manual call points.

4.0 Procedure

4.1 General Requirements

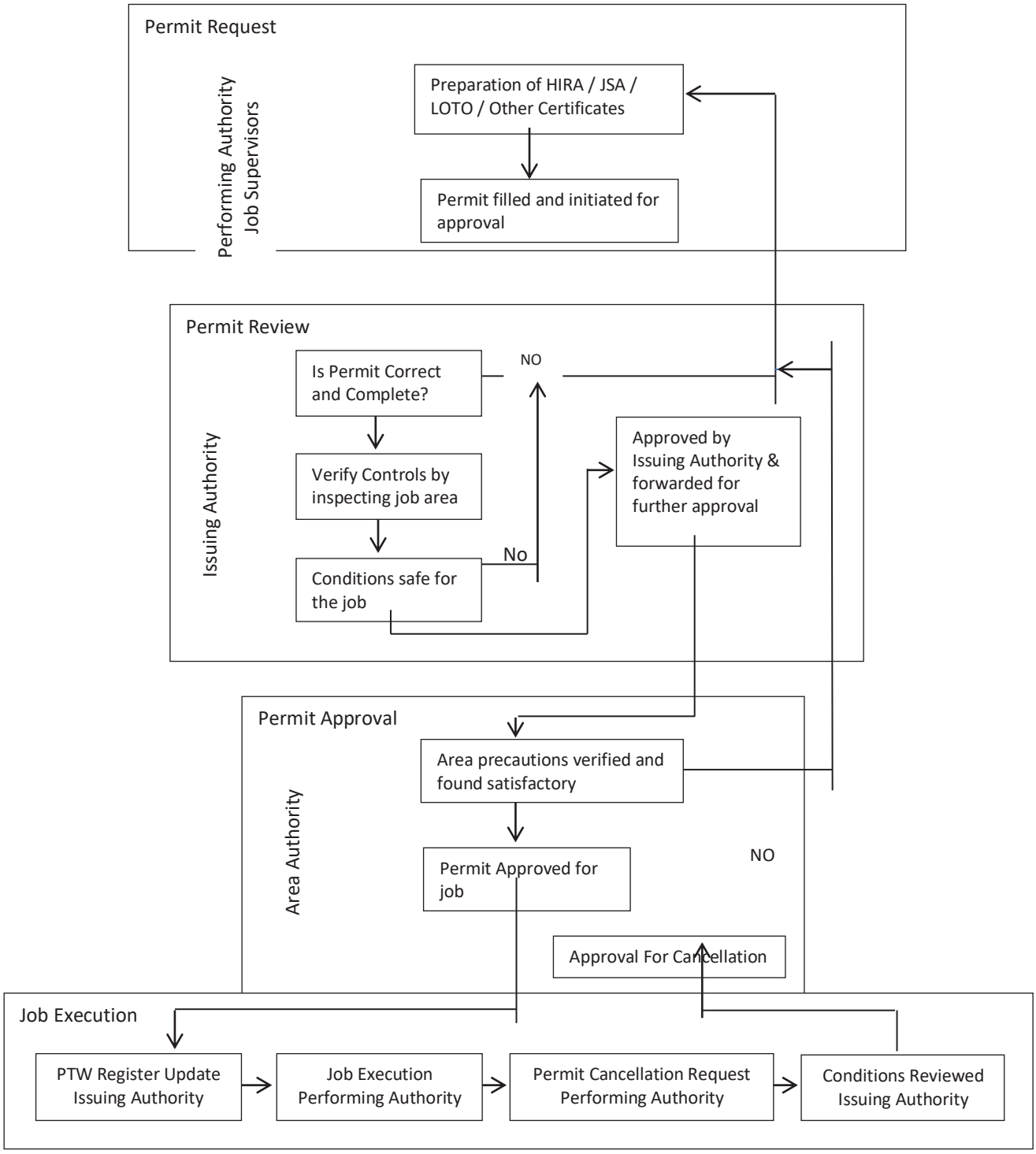
- The PTW process is a key element of Control of Work (CoW) and shall be used to confirm that work is performed in a safe and environmentally sound manner.
- The PTW system utilizes a form of permit that requires review and approval prior to the commencement of work. The purpose of the system is to verify that work between different teams working in proximity to each other is identified and that work is reviewed for potential HSSE clashes.
- The PTW process manages work activities and provides guidance for the development of a more detailed and written SWP for larger and more complex activities prior to initiating any work.
- A PTW is normally required for non-routine maintenance work involving facilities, equipment, systems, or processes. Non-routine activities that require a PTW include, but are not limited to:

- Hot Work
- Cold work—non-routine hazardous activities

- Vehicle Entry
- Electrical Work
- Confined Space Entry
- Critical Lifts
- Excavation activities
- Radiography activities

➢ **Permit to Work (PTW) Usage: A permit is used to:**

- Identify the scope of a specific task and where the work will be conducted.
- Communicate activities throughout the facility or park through a PTW review meeting that is held daily.
- Identify hazards and controls associated with the work task (the JSA process).
- Identify the personnel who have oversight responsibility.
- Identify the personnel performing the work.
- Assign responsibility for various tasks.
- Identify potential SIMPOPS issues with other work activities through the PTW review meeting.
- Identify energy isolations, lockout, and tagout that will be in effect for the work that is being conducted.
- Verify adequate control over the return to normal operations.



PTW Process Flow

4.2 Types of Work Permits

Seven types of Permits are used within the PTW procedure, each controlling a specific type of job and activity.

4.2.1 Hot Work Permit (HWP)

- A hot work permit shall be required for work involving the use of a flame or other sources of ignition. Some examples include:

  - Electrical welding and use of welding machine.
  - Flame Cutting.
  - Grinding (producing sparks).
  - Drilling, Chipping, Sand Blasting etc.

- Hot work activities requiring the issuance of a Hot Work Permit (HWP) will utilize the SABQ Permit to Work form **(HSE-FRM-020)**.

4.2.2 Cold Work Permit (CWP)

- A cold work permit shall be required for potentially hazardous work not covered by other types of work permits. Some examples include:

  - Chemical cleaning or use of solvents,
  - Handling of hazardous substances (e.g., toxic/corrosive chemicals, asbestos, etc.),
  - Use of resins, typically used during blade repairs,
  - Any painting activity,
  - Erecting or dismantling scaffolds,
  - Any non-routine and potentially hazardous activity,
  - Any activity requiring specific control measures to confirm safety,
  - Civil Works, bolt tightening, removal of chokes, glands from valves etc.

- Cold work activities requiring the issuance of a Cold Work Permit (CWP) will utilize the SABQ Permit to Work form **(HSE-FRM-021)**.

4.2.3 Vehicle Entry Permit (VEP)

- A Vehicle Entry Permit shall be required when a vehicle is to enter into restricted area. Gas test shall be required and gas test box provided in the permit must be filled if the vehicle has to leave the designated track. Some examples include:

  - Vehicle,
  - Engine (prime Mover) driven equipment.

- Any vehicle entering into restricted area requiring the issuance of a Vehicle Entry Permit (VEP) will utilize the SABQ Permit to Work form **(HSE-FRM-022)**.

4.2.4 Heavy Lift Permit (HLP)

- A Heavy Lift Certificate shall be required for jobs involving moving/lifting of heavy loads (critical lifting, load greater than 10 ton). Some examples include:

  - Process Equipment,
  - Lifting involving two or more lifting/pulling appliance,
  - Storage Tanks,
  - Heavy Beams, large die pipes etc.

- Any critical lifting requiring the issuance of a Heavy Lift Permit (HLP) will utilize the SABQ Permit to Work form **(HSE-FRM-023)**.

4.2.5 Radiography Work Permit (RWP)

- A Radiography Permit shall be required for any work involving radiography. This is to prevent exposure to the radioactive substances to the personnel.
- Any radiography activity requiring the issuance of a Radiography Work Permit (RWP) will utilize the SABQ Permit to Work form **(HSE-FRM-024)**.

4.2.6 Excavation Work Permit (EWP)

- An Excavation Permit (ground disturbance) shall be required for any excavation or ground disturbance activity that involves digging, trenching, excavating or removing soil or ground.
- If excavation will be conducted utilizing mechanical equipment such as trenchers, backhoes, bulldozers, etc. a designated spotter will be added to the permit to confirm

that adequate observation is being conducted to prevent contact with overhead power lines and to observe for any unusual objects or sounds from the excavation. This person will be dedicated to this purpose and listed by name of the permit.

- Any excavation activity requiring the issuance of an Excavation Work Permit (EWP) will utilize the SABQ Permit to Work form **(HSE-FRM-025)**.

4.2.7 Confined Space Entry Permit (CSEP)

- A confined space entry permit is required to allow personnel to enter a confined space such as a blade, trench, tank, vessel, etc.
- A confined space entry permit allows access and inspection only.

- When hot work, cold work, electrical work, and/or energy isolation work is carried out in a confined space, an additional permit(s) (as required by the type of work) must be applied for and cross referenced to the confined space entry permit.
- Any confined space activity requiring the issuance of a Confined Space Entry Permit (CSEP) will utilize the SABQ Permit to Work form **(HSE-FRM-026)**.

4.3 Electrical/Mechanical Isolation

An isolation certificate is required for work on electrical or mechanical systems where there is a possibility of contacting energized electrical conductors or energized moving/rotating machinery. Some examples include:

- Work involving the installation or repair of electrical conductors,
- Connection or disconnection of electric motors,
- Reaching into any panel, transformer or other electrical enclosure which may have energized circuits, capacitors, wiring etc.,
- Work on instrumentation, instrument panels, or telecom equipment,
- Where removal of a part of the circuit takes place outside normal operating conditions.
- Work on water, air steam or hydraulic oil lines under pressure,
- Maintenance work on valves that regulate any fluid line,
- Working inside any tank, vessel, pipe, ducts, process line or equipment which may have energized rotors to move rotating parts.

Electrical/Mechanical activities requiring the issuance of an Isolation Certificate will utilize SABQ the Isolation Certificate (HSE-FRM-040)**. Refer to "Electrical Safety & Energy Isolation Procedure (HSE-SOP-018)".**

4.4 When Work Permits are Required

This section describes the criteria for application of the permit to work system during fabrication, construction, manufacturing, workshop and pre-commissioning activities.

4.4.1 Types of Work Not Requiring Work Permit

The following activities will not require a permit to work; however, site management still has the authority to decide that these activities may require a PTW, depending on the actual site conditions:

- Work involving only visual observation performed by engineers, inspectors, supervisors, drivers, office workers, caterers, and office helpers does not require a written permit to work, as long as it does not pose a significant hazard (i.e., fall, confined space, electrical, heavy lift, radiography, excavation, road closure, and entry into restricted areas).
- Routine work performed by technicians, sweepers, floor men, etc. does not require a separate written work permit when the work is performed in their normal work area (such as designated workshops), and it does not pose a significant hazard.
- Routine work performed by mechanics, including inspections, maintenance, and breakdowns of mechanical equipment they normally operate and control, does not require a separate written work permit, as long as the inherent risks are not too significant and do not involve the handover process.
- Work performed in designated workshops on equipment considered part of the shop does not require a separate work permit unless the equipment needs to be locked out or is considered to be a confined space.
- Work on equipment imported into a designated shop from other locations does not normally require a permit unless the work involves a confined space.
- Scaffold erection and dismantling work on general scaffolds does not require being designed by a registered professional engineer and poses no significant hazard.
- Non-critical cold work activities such as opening lines during construction, insulation works, equipment preservation, form works, concrete pouring, and road works will not require a permit to work.

4.4.2 Types of Work Requiring Work Permit

The following activities will require a permit to work, as a rule:

- All hot work activities on site, including, but not limited to, welding, torch cutting, speed cutter, grit blasting, grinding, soldering, metal chipping, power brushing, use of open flames, post-weld heat treatment, or any activity that can produce sparks or generate enough heat to ignite combustible materials,.

- All cold work activities of a critical nature should be done under a permit to work. These include engineered scaffolds, platform erection, grating removal, work in man-baskets, work in man-lifts, and pressure testing.
- Any energy isolation work shall be carried out under an Isolation Certificate (HSE-FRM-040) attached. The type of certificate will depend on the type of activity. Mechanical and electrical isolations may be required, although these are normally limited during construction and pre-commissioning. The electrical isolations have to be designed and authorized by the appointed Senior Authorized Electrical Person.
- Painting activities shall be carried out under a hot work permit due to the possible flammable atmosphere that can be generated by paint fumes, thinners, solvents, and epoxies.
- Any radiation work involving the handling of radioactive materials, such as radiography work, working in or on equipment containing radioisotopes, and removing or servicing radioisotopes, requires a radiography permit.
- All confined space works or work in areas not designed for continuous worker occupancy and having limited means of access or egress that may be subject to the accumulation of toxic and/or flammable materials or any oxygen-deficient or rich environment requires a confined space entry permit attached to a hot work permit. Examples of these include, but are not limited to:
- Entry into storage tanks, process vessels, bins, boilers, heaters, ventilation or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and excavations, one (1) meter and greater in depth, may have a potential oxygen-deficient atmosphere.
- All excavation work on the ground requires an Excavation Work Permit.

4.5 Initiation of a Permit to Work

A work permit (PTW form) must be filled out and approved at the beginning of each workday before work commences. The work permit is a daily permit and will need to be signed off at the end of each workday with comments related to the day's progress.

- The performing authority initiates the permit process by completing the sections of the work permit on the permit form.
- If the work activities include energy isolation (LOTO), hot work, cold work, confined space, excavation, radiography, heavy lifting, and vehicle entry, the performing authority will initiate these permits as well.
- The Performing Authority must complete a JSA/Task Risk Assessment identifying the key steps of the task, the hazards involved with each step, and the methods for controlling each identified hazard.
- The performing authority will submit the completed permit(s) and JSA/TRA to the issuing authority for approval. It is the permit requester's responsibility to ensure that the issuing authority has all of the necessary information to determine the proper safety procedures to be followed.

- Following the completion of the permit, the performing authority shall give the permit to the issuing authority for review and approval. If the issuing authority approves the permit, he shall take the permit to the area authority for review and approval.
- At a minimum, all hot work, confined space entry, excavation, "live" electrical work, critical lifts, cold work, vehicle entry, and radiography require a permit signature by the area authority.

4.6 Permit Approval

The permit(s) and JSA/TRA application are submitted to the area authority for approval. The permit application is reviewed for impact on all proposed activities and to confirm that all potential hazards have been identified and precautions specified. Additional information will be added when necessary.

When the initial information is insufficient, the application will be rejected. The application can be resubmitted when the necessary information is filled out on the permit.

The permit is then approved, subject to specified detailed precautions being implemented under the responsibility of the issuing authority.

4.7 Permit Preparations

The issuing authority shall confirm that all necessary precautions are defined, implemented, and maintained in place during the permit validity period.

The issuing authority shall confirm that all potential hazards from ongoing and potentially conflicting activities (SIMOPS) are identified. If necessary, additional precautions shall be put in place, including liaison with all affected issuing authorities.

A permit shall only be issued after all required safety equipment is in place and all defined isolations are fully implemented.

4.8 Permit Commencement

Utilizing the JSA/TRA process, the performing authority must explain the permit conditions to all parties involved with the job before they start work. All personnel working on the permitted job must sign the Job Safety Analysis/Tool Box Talk that is maintained and posted at the work site.

Should new personnel be assigned to an active permit, the performing authority must review the JSA and work scope with the new personnel. Only then can the new personnel commence work on the active permit.

Should any employee working on a permitted job consider that conditions are unsafe for work to continue, he or she should immediately inform all personnel working on the job, stop the work, make the work site safe, and inform the performing authority and/or issuing authority.

If the work scope changes (e.g., hot work or confined space found to be necessary after starting work), an application must be made for a new permit of the appropriate type for the additional work.

The issuing authority may withdraw a permit at any time if the specified precautions and conditions are breached, become invalid, or if operational safety is compromised.

4.9 Work Progress

Depending on work progress, the following instructions shall be followed as applicable:

- If the work is completed by the end of the shift, the requirements of the Job Completed section apply.
- If the work is incomplete at the end of the shift or is suspended during the shift, and the work is intended to continue on the following or subsequent shifts, a new permit must be issued.
- The issuing authority shall confirm that the permit and specified precautions and conditions are still valid and that the work does not conflict with ongoing work activities. When appropriate, this involves a worksite visit by the issuing authority or a suitable delegate. Gas testing and the application of safety bypasses must be carried out where specified and applicable. Isolation security must be verified where practical.
- The Performing Authority shall explain the permit conditions (utilizing the JSA) to all persons before they start work and shall confirm that newly involved personnel's signatures are added (at the work site) to the JSA/TBT.

4.10: Work Completed or Work Delayed and Permit Invalid

- Whether work is completed or work is delayed and a permit becomes invalid, the performing authority must confirm that the site is left safe and tidy and that all personnel have been withdrawn.
- The performing authority shall communicate the work status to the issuing authority.
- The Performing Authority shall confirm that the work for which the permit was prepared has been completed or delayed, all personnel have been withdrawn, and all plant processes and equipment affected by the work have been left in a safe condition.
- The issuing authority shall have the site checked.
- Where work has been delayed and can now be completed, any new permit must identify the above permit's isolation status, specified precautions and conditions, and all new requirements.

- The issuing authority shall file each permit and its associated documentation, which shall be maintained at the worksite for a minimum period of one year.
- Upon completion of work, and particularly for unique or complex work activities, the knowledge gained should be shared throughout the SABQ organization using the Lessons Learned process

4.11 Emergency Suspensions

- Any time an emergency situation or alarm occurs at the site, **ALL PERMITS ARE SUSPENDED**. This confirms that personnel are disengaged from the work and that all work activities cease during an emergency or perceived emergency. Before work activities may resume, the work areas shall be assessed by the performing authority. If determined to be safe for work, the performing authority will notify the issuing authority, and the issuing authority will authorize the resumption of the work activity.
- Similarly, if anyone calls for a work stoppage (stop the job) because of a perceived or real safety hazard, the permit is immediately suspended, and the 'Emergency Response Plan' procedure shall be followed to resolve the situation or concerns. Once again, the Performing Authority will assess the work area, make changes to the JSA, etc., before resuming the work.
- If the work stoppage occurs because the scope of work at the work site exceeds or is not accurately described on the permit, the permit is to be immediately cancelled by the performing authority, and this cancellation will be communicated to the issuing authority and area authority. An investigation will be conducted into the reasons for this and the corrective actions taken before a new permit request is presented for review and approval.

4.12 Limitation of Active Permits

To confirm that adequate management of all work activities is maintained, the area authority, in conjunction with the issuing authority, may place a limit on the number of active permits that the issuing authority can control at any one time. All applications for permits in excess of those allowed by the Area Authority shall be held and issued only when active permits are canceled or suspended.

4.13 Duration of Permit

Permits shall be approved for the work scope and time period specified on the permit. A permit must be suspended and re-issued after one of the following scenarios has occurred:

- One work shift, with a maximum time of 12 hours, has ended.
- When the work plan deviates from the original plan.
- After work, the scope changes.
- When there is a change in the personnel involved.
- Whenever an emergency alarm is sounded,.

4.14 Permit to Work (PTW) Register

Permits issued for work on specific equipment shall be recorded in the master control sheet and cross-referenced clearly in PTW. Each permit will have a unique number. A record of all issued permits shall be maintained on the **"Permit to Work Register (HSE-FRM-031)"** by the issuing authority and HSE representative.

5.0 Training

Training will be carried out for all persons involved in the PTW system. The training will comprise theoretical and practical components, and a test will be written to ensure that the attendees have understood the system. The person attending PTW training will also be issued a copy of the PTW procedure.

The following permit-related work-related training will be carried out:

- Permit to Work
- Electrical and Energy Isolation/LOTO Training
- Authorized Gas Tester
- Fire Watch

6.0 References

- ISO 45001:2018 OHS
- ISO 14001:2015 EMS
- Health and Safety Executive, UK
- SABQ HSE Management System
- Occupational Safety and Health Administration (OSHA), USA
- ADNOC: HSE Management System Guidelines

7.0 Attached Documents

- HSE-FRM-020: Hot Work Permit
- HSE-FRM-021: Cold Work Permit
- HSE-FRM-022: Vehicle Entry Permit
- HSE-FRM-023: Heavy Lifting Permit
- HSE-FRM-024: Radiography Work Permit
- HSE-FRM-025: Excavation Work Permit

- HSE-FRM-026: Confined Space Entry Permit
- HSE-FRM-027: Confined Space Attendant Authorization
- HSE-FRM-028: Gas Testing Certificate
- HSE-FRM-029: Competent Gas Tester Authorization
- HSE-FRM-030: Fire Watch Man Authorization
- HSE-FRM-031: Permit To Work Register

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

SAFETY SIGN BOARDS

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

This Standard Operating Procedure (SOP) documents SABQ's approach to the management of safety signage. The purpose of this procedure is to outline the requirements of selection, installation, placement and maintenance of safety signage to adequately manage and minimize the risk of injury or harm and to communicate HSE related information to the workers, contractors and visitors.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of Elite Engineering Private Limited. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition:

Danger signage: Used in a situation this likely to be life threatening if the message is ignored.

HSR: Health and Safety Representative.

Manager: The manager who has directly responsibility for the activity being performed or the area the activity is occurring in.

Officer: Is the person who makes, or participates in making decisions that affect the whole, or a substantial part, of the organization's activities.

PPE: Acronym used for Personnel Protective Equipment.

Sign: Inscribed board, plaque or other delineated space on which the combination of legend and symbolic shape is used to convey a message.

Supervisor: Term used for any employee who acts or is appointed as a supervisor, coordinator or team leader.

Warning signage: Used in a situation which is likely to be hazardous but not likely to be life-threatening if the message is ignored

WHS: Acronym used for Work, Health and Safety.

WHSQ: Acronym used for Workplace Health and Safety.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Shall be responsible to provide, resources required to prepare sig boards.
- Reviews and approves all the sign boards being prepared for the site.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Lead

- Shall be responsible to ensure that all personnel wear the required fall protection before they deployed to the jobs at height.
- Shall be responsible to scheme and perform the HSE training for the personnel.
- Shall be responsible to ensure that the inspection schedule of all fall protection equipment and procedure is being followed.
- Shall be responsible to measure compliance of this procedure through audits and inspections.
- Shall be responsible to initiate action against violation of this procedure.

3.6 Job Supervisor

- Shall be responsible to ensure that workers have received proper training on fall hazard recognition, fall prevention measures, and the use of fall protection equipment.
- Shall be responsible to ensure visual and documented inspections of fall protection equipment.
- Shall be responsible to assure that provisions for prompt rescue of fallen employees are planned.
- Shall be responsible to assure that fall protection equipment is used in compliance with this work instruction including manufacturer and regulatory requirements.

4.0 Procedure

The purpose of having HSE signage in the workplace is to identify and warn workers who may be exposed to hazards in the workplace. Safety signage can assist in the communication of important instructions, draw attention to objects and situations affecting health, safety and environment, reinforce HSE messages and provide instruction for emergency situations. Workplaces have an obligation under HSE legislation to use signage where practicable to highlight a serious hazard or risk in the workplace.

4.1 GENERAL :

Safety signage across all worksites must be of consistent quality and professional standard signage is an administrative control and must not be chosen as the primary control measure signage is classified into four different categories. These include:

4.1.1 Regulatory signage:

The regulatory signage is the range of signage which is used to indicate the restricted areas with a proper sign board of smoking pasted on wall. The evacuation area should be properly barricaded and the sign board should be visible to the workers and trespassers, similarly if there is no pedestrian in the working area or any other place where the regulatory signage is mandatory.

The basic regulatory signage of the restricted workplaces is listed below:

- Prohibition signage(Such as smoking prohibited, no Pedestrian access, digging prohibited)
- Mandatory signage (Such as Eye protection must be warned, Hearing protection must be warned)
- Limitation or Restriction signage (Such as speed limit signage)
- Warning signage(Such as confined space and asbestos warning signage)

Figure 1: (Smoking Point\ No Pedestrian access\ Evacuation)

4.1.2 Hazards Signage:

Hazard symbols or warning symbols: Are recognizable symbols designed to warn about hazardous and dangerous material, location, or objects, including electric currents, poisons, and radioactivity. The use of hazard symbols is often regulated by law and directed by standard organizations. Hazard symbols may appear with different colors, background, borders and supplemental information in order to specify the type of hazards and the level of threat .The danger signage such as confined space, overhead power and forklift traffic hazards are the most important danger signage of confined space entry is the most critical job of health and safety. The confined space entry needs proper permit which can be achieve by electrical isolation, mechanical isolation and elastic potential isolation. Proper gas testing is done before entering in the confined space by BM25 and BM26 devices. It is the most restricted place of any site. confined space entry danger sign board is used so that message is clearly convey that the entry is not allowed without proper legal procedure.

Forklifts: Are the most useful tool but safety has to be come first. A forklift doesn't move in the same way that a car does, the sign board are crucial in any work environment. The primary importance of displaying safety signage is to prevent injury and ensure staff and visitors are well aware of the possible dangers and hazards ahead in certain situations and/or environment.

The types of the danger signage are listed below:

- Danger signage(Such as confined space, overhead power)

- Warning signage (such as electric shock risk, asbestos, forklift hazard, and slippery when well)

Figure 2: (Danger Overhead\Confined space\Forklift)

4.1.3 Design and layout of signage:

The type of signage used must be suitable for the intended purpose. Safety signage of occupational environment. Where no symbol is available for a required purpose, a warded message signage is to be used.

4.1.4 Installation of signage:

Signage other than those painted directly on existing surface is to be constructed and erected so that they do not create a hazard (Signage do not project into walkways or road ways so that persons or mobile plant including vehicles could strike them).

Signage is to be located where the messages are legible and clearly visible so that they can attract. The attention of all workers (e.g. located at eye height, adjacent to plant such as lathes or at entrances to buildings/facilities). This also includes the installation of place at the front of the facility, tanks and buildings were required.

Signage is to be installed in locations, where there is limited possibility of them being obscured (e.g. placing Items in front of signage or being overgrown by trees etc.). Placing several signage close together should be where able practicable as this may lead to confusion and make it difficult to distinguish individual messages.

External or internal signage should be illuminated where it is required under legislation or where there is poor visibility as determined by a risk assessment. All signage are to be kept clean and in good condition (e.g. not faded).

4.1.5 Removal of signage:

The Supervisor/PICOW (Person in charge of work) must ensure safety signage are removed

- Immediately after the information they contain is no longer relevant
- When the hazard ceases to exit

4.1.6 Site specific management of safety signage:

Emergency evacuation route signage board helps the worker and visitors to find the nearest emergency. Evacuation route quickly during fires, floods, hurricanes, bomb threat and other emergency with other emergency exit signage evacuation route signage board help to guide the people to lead to the exit doors in case of emergency.

Evacuation assembly point sign boards are used to guide workers to lead to the mentioned assembly point in the case of emergency. In the case of emergency all the staff members and workers should report to the assembly point and wait for the further instructions the assembly points are mentioned at different location of the site. No access public access sign board is a useful tool to help meet safety compliance and guidelines. Create a safe workplace and keep employees protected with our all site signage.

Traffic management sign boards are used to manage the traffic. Traffic moves in one direction so the traffic management sign boards are mandatory. The excavation signage means that there is excavation at the side of the road. The road diversion signage means that there is a diversion on the road. There are other signage that must be installed. These include:

- Evacuation signage
- Traffic management signage
- Office/Reception/Stores signage
- Public access signage
- Evacuation assembly point signage

Figure 3 :(Evacuation Route\Traffic management\No public access\ Assembly Point)

4.1.7 Emergency information signage:

Emergency information signage is designed to indicate the location of or direction to, an emergency facility. This first aid signage features the text first aid in large letters below a large first aid cross. Emergency eye wash station is required for work requirements that may employees to harm chemical exposure, accident can still happen. Eye wash stations are designed to immediately flush contaminants out of the eyes after exposure. They should be located at high risk areas and should have ability to be achieved immediately.

Safe sign boards of emergency where eye wash stations are located at your facility. The high quality safety durable safety signage is affordable and made to last.

Figure 4:(First Aid\Emergency Eye Wash)

4.1.8 Fire signage:

Fire extinguisher signage is available in the variety of different materials to allow them to use in different environments and fixed in different ways. The main types of fire extinguisher are covered by specific signage for CO2, AFFF, Water or Dry chemical power. Some extinguisher signage also gives instructions for use. Fire extinguisher signage is only a small part of an overall fire safety program. The main types of fire extinguisher signage are:

- Dry Powder extinguisher instructions for use-glow in the dark signage
- CO2 extinguisher instructions for use –glow in the dark signage
- AFFF extinguisher for use –glow in the dark signage

Figure 5:(Dry Powder\Foam\CO2)

All workplaces should have arrangement of detecting fire. Consideration must be given to any parts of the workplace where a fire could start and spread undetected. This could be a storage area or basement that is not visited on a regular basis, or a part of a workplace that has been temporarily vacated, for example at a meal times. Fires that start and unnoticed can pose a serious danger to people in the workplace.

In workplaces where fire could develop for some time before being discovered, it's important to protect vital escape routes. In almost all buildings, a suitable electrically operated fire warning system, with manual call points positioned both on exit routes and adjacent to final exits should be installed.

In more complex buildings such as retail premises, where the evacuation system is based on staged or phased evacuation, or where people are unfamiliar with the warning arrangements. If an automatic fire detection system and a manually operated electrical alarm system are

installed in the same workplace, they should normally be incorporated into a single integral system. Voice evacuation systems should be similarly integrated to prevent confusion.

Figure 6: Fire Alarm System

4.2 HSE equipment's sign boards:

Safety sign boards are used to draw attention to health and safety hazards. When sign boards are used in workplace ensures that they are sufficiently large and clear to easily seen and understood. For example when describing the available equipment the safety signage should show clearly where that equipment is located. All safety signage require adequate illumination sign and size should be appropriate for intended viewing distance.

4.2.1 Electrical safety signage:

Electrical safety is a major problem in modern workplaces. Electrical safety signage communicates important information to workers. They can also be one of the most efficient tools in a facility manager's toolkit.

The types of electrical safety signage are as following:

- Battery charging signage
- Custom electrical safety signage
- Overhead power lines signage
- Electrical equipment signage
- Electrical panel signage
- Electrical room signage
- Electrical tag signage
- High voltage signage

Battery charging signage: OSHA takes battery charging safety very seriously and according to its regulations, battery charging installations must be located in designated battery charging areas because of the danger of hydrogen gas and battery acids. Installing battery charging signage is a great precautionary measure to take in order to use worker injuries from potentially dangerous situations. By posting battery charging signage in these areas, workers are warned to the hazards of smoking or bringing an open flame near the charging station.

Electrical tag signage: Are great way to notify people of electrical hazards they may not be aware of in areas where safety signage and safety labels can't be posted. These areas can be

dangerous and result in injury because these electrical hazards are often invisible threats. Areas with high voltage equipment are one place where electrical tags are really important.

Custom electrical safety signage: With dangerous electrical equipment, it is important to alert workers of specific hazards. Custom electrical safety signage and custom high voltage signage call attention to the dangers of overhead lines, battery charging stations, and much more. Custom electrical safety signage can help to prevent injury, electric shocks, and fire.

Figure 7: (Battery Charging\Custom electrical hazards\High voltage)

Electrical panels signage: When an employee receives a shock from an electrical circuit or appliance in the workplace, shutting off the source of power may be the only safe method of preventing the individual from contacting the electric source. Electrical panels contain circuit breakers designed to trip and stop the flow of current to specific circuit and appliances. Safety sign boards of electrical panels are necessary to prevent from any fatal incident or electric shock.

Figure 8:(High voltage\ Electrical Panel)

4.2.2 Machine safety signage:

Employees who work with machinery can find themselves in hazardous situations where the severe injury might occur to them or someone else. Posting machinery safety signage around

the areas in your facility where machines are used can remind equipment operators of the dangers around them and how to protect.

The following types of machines safety sign board are listed below:

- Overhead crane sign board
- Lifter sign board
- Grinding machine sign board
- Cutting machine sign board
- Drill machine sign board
- Welding Plant sign board
- CNC machine sign board
- Rolling machine sign board

Overhead crane sign board: There are some safety precautions of overhead crane sign board. No one but the regular authorized. Operator is allowed to use any crane. Do not carry a load over a people on the floor as it can cause fatality or it can cause a catastrophic event. There should be sound warning devices to alert person nearby. It can never be allowed a person to ride on a load carried by the crane or on the crane hook. Before moving the trolley or bridge, be sure that the hook is high enough to clear all obstacles. It is dangerous to drag slings, chains, or lifting devices out from under loads that have been landed. Never pull a hoist by the pendant cable and never leave the controls intendent while the load is suspended. Lower the load to the floor if it is necessary to leave the controls. Warning signs and markings should be present in all workplaces operating a crane to communicate dangers and hazards with the machine.

Figure 9: (Overhead Crane sign boards)

Lifter safety: Is the most important in the workplace. Back injuries are one of the most common injuries in the workplace. Back injuries have been occurred in the workplace due to lack of safety precautions. Many back injuries are a result of improperly lifting heavy large objects, but with the help of safety lifting signage, these injuries can be avoided. Lifting instruction signage use to give direction to workers to use techniques that protect their back from being strained, reducing down time and increasing productivity.

A power drill: Is a handy tool that saves a lot of effort and time. It consists of several drill bits that can be used interchangeably. Power drills operate on electricity and can be corded or cordless. Power drills give off intense vibrations, especially on high torque and it can also reach to the high temperature because of the high impact and friction. For this purpose safety gloves can be used to work with power drill. Safety googles are also used while drilling when operating a power drill, tiny material from the materials from the target surface may fly off into a surrounding space and it can also enter in the eye, which cause severe infection and blindness.

Wear the thick jacket to protect while working with the power drill. Always avoid long clothing that can get entangled in the work surface. Turn off the drill before changing drill bits. After every drilling job, turn off the switch and unplug the power cord. Never change drill bits when the power cord is still connected to the power supply. If the button is pressed accidently the person can be seriously injured.

Ensure that the chuck is tight before using drill. The chuck is the restraining mechanism that holds the drill in the place. A power drill can have a keyed or key-less chuck. A keyed chuck needs a special key to turn the chuck and tightened it in place. When the drill job is finish the drill must be unplug the drill, loosen the chuck is hazardous.

Figure 10: (Lifter sign board\ Drilling sign board)

Grinding and cutting machine signage: The most common resin-bounded wheels are depressed center for grinding and cutting type although these wheels are strong enough. They are not immune to breakage. A wheel should break apart in use; pieces of the wheel could strike and or injured a co-worker. Never grind with the wheel that is designed exclusively for cutting. Such a wheel is not constructed to withstand the side pressure exerted when grinding. The inspection of the wheel for possible damage before mounting the grinder if in doubt, don't use it. Never use the wheel if it has nicks, cracks, or if it has been dropped. Allow the fully newly mounted wheels to run at full no load speed on the grinder and never exceed the maximum RPM (Rotation per minute) rating indicated on the wheel. The wheel must be affixed to the grinder with the correct mounting flanges. Using improper flanges can impart damaging stress to the wheel.

Figure 11:(Rolling safety\ Traffic hazards\Face shield safety)

4.2.3 Flammable materials signage:

Flammable and combustible liquids vaporize and form flammable mixture with air, when in open containers, when leaks occur, or when heated. To control these potential hazards, several properties of these materials, such as volatility, flashpoint, and flammable range and auto

ignition temperatures must be understood. Information on the properties of a specific liquid can be found in that liquid's safety data sheet.

A flammable material: Is defined as material that ignites more easily than other materials, making it more hazardous to health substance that still burnt but aren't as easily ignited are referred to as combustible and pose less of threat.

A flammable liquid Is defined as a liquid with a flashpoint of 60 degree Celsius or below.

Flammable substances: Include fairly common place things to find around a workplace, like petrol, ethanol, methanol and acetone but even everyday material like wood and paper are combustible if they are exposed to high temperatures, so care should be taken to store both flammable and combustible substances.

Gas cylinder areas: In your facility can be very dangerous place to workers. Smoking and open flames in close proximity to your compressed gas cylinders could cause an explosion and severely injured people in this area. With gas safety signage, workers can be constantly reminded that gasses pose serious threat if they are not use with proper safety. The sign board of gas cylinder should be pasted properly so that the worker may know its dangerous effects.

Some areas are restricted to the smoking point. Zone 0 is the most critical zone that is continuously flammable. These areas should be restricted with smoking and other combustible materials. The sign board of smoking is necessary in these places.

- Custom flammable material signage
- Gas identification signage
- Flammable warning signage
- No smoking signage
- Explosive signage

Figure 12:(Danger Combustible\Emergency Gas\No smoking\Danger Explosive)

4.2.4 Personnel Protective Equipment (PPE's):

Making the workplace safe includes providing instructions, procedure, training and supervision to encourage people to work safely and responsibility.

Even where engineering controls and safe system of work have been applied, some hazards might remain. These include injuries to:

- The lungs, e.g. from breathing in contaminated air
- The head and feet, e.g. from falling materials
- The eyes, e.g. from flying particles or splashes of corrosive liquids
- The skin, e.g. from contact with corrosive materials
- The body, e.g. from extremes of heat and cold

Following types of personnel protective equipment sign board are listed below:

- Eye Protection signage
- Face shield signage
- Foot protection signage
- Hand protection signage
- Hard hat signage
- Hearing protection signage
- Custom PPE signage

Figure 13:(Eye Protection\Face shield \Foot Protection\Hearing protection\Hard Hat Area)

4.2.5 Keep away signage:

Workplace safely can be in part be ensured by using the correct safety signage in the areas require for them. In areas of the warehouse or facility that need to remain clear for safety or cleanliness reasons, keep clear signage as a right box . These safety reasons could be for fire code regulations for emergency exits or fire equipment, or to keep area clean from clutter which could otherwise cause an incident.

- Caution tape
- Custom keep away signage
- Do not entry safety signage
- Keep clear signage
- No admittance signage

Standard barricade tape: Comes with printed legends to mark off restricted or dangerous areas. Barricade tape is available in a variety of wording. Including caution barricade tape and danger barricade tape.

Caution barricade tape: Help alert your workers or visitors of dangerous areas. Choose from a variety of printed warnings and enhance safety in your workplace with Seton's Caution barricade tape.

Figure14: Barricade Tape

Confined space barricade tape: Is used to barricade the confined space. Confine space is the most crucial and critical place to worker. There is a high risk in the confined space, leakage of toxic gases like H2S, CO2, and Nitrogen dioxide can be released which can cause fatality.

Figure 14: Confined Space barricade

No admittance signage: Keeping unauthorized people from entering specific areas of your facility or properly is important for security and safety reasons. Posting no admittance signage on doorways or on gates to these areas will let them know that you must be permitted to enter these premises. With no admittance signage the people can be warned which are not allowed to enter the area without permission or unless authorized. Admittance prohibited signage also inform people not to use specific doorways to access your facility or not enter the area after a specific time period.

Figure 15:(Do Not Enter Signage\Strictly no admittance signage)

4.3 Maintenance of sign boards:

All safety signage must be properly maintained so they are capable of performing the function for which they are intended. This can range from the routine cleaning of signboards to regular checks of illuminated signage and testing of acoustic signals to see that they work properly. All safety signage should maintain their intrinsic features under power failure either from

emergency lightening or phosphorescent material unless the hazard is itself eliminated by power failure.

4.4 Safety colors:

The safety colors have specific meanings. The following colors are listed in the table below:

Color	Meaning or purpose	Instruction or information
Red	Prohibition signage Danger Alarm	Dangerous behavior; stop; shutdown; emergency cut –out devices; evacuate
Yellow Amber	Warning signage	Be careful; take precautions; examine
Blue	Mandatory signage	Specific behavior or action , e.g. wear protective equipment
Green	Emergency escape First aid signage No danger	Doors; exit; escape routes; equipment and facilities, return to normal.

Table 1: Safety Colors

4.5 Prohibitory signage:

Prohibition signage is the type of signage that is used to try and prevent various activities in certain situations. They're commonly used to identify actions that are either not authorized because they are not conform to the rules and regulations of the given area, or those actions could potentially cause a risk to the health and safety.

These signage send a clear message to all who see them that some actions are either not safe or are outright not permitted. Prohibition signage is crucial component to maintain the safe practice and other in the workplace, whilst also helping to adhere to health, safety and signage regulations.

Typically this signage is easily identified by their round shape, outlined by a bold red circle and diagonal line which extends from the top left down to the bottom right. More often than not, this circle is positioned above a black symbol on a white background, with any related text to the side or underneath, in black and white –especially if they are instructional signage such as "No signage" or "Do Not Signage".

The entire purpose of this signage is to be visible and thereby prevent any kind of behavior which may lead to danger or an accident; making it imperative to have the correct prohibition signage in areas in which it is needed.

Figure 16: Prohibitory Signage

4.6 Warning signage:

Warning signage is some of the most common signage posted in the workplace. These workplace signage alert people to hazards and convey important information about avoiding or dealing with those hazards. Floor signage is especially effective at providing hazard warnings because they can be placed at the right position where people need to be warned. The hazards signage and warning signage are mostly posted on the walls and floor.

Figure 17: Warning Signs

4.7 Emergency escape signage:

An exit route is a continuous and unobstructed path of exit level from any point within a work place of safety. An exit route consists of three parts:

- **Exit access-**Portion of an exit route that leads to an exit.
- **Exit –** Portion of an exit route that is generally separated from other areas to provide a protected way of travel to the exit discharge.
- **Exit discharge-**Part of the exit route that leads directly outside or to a street, walkway, refuge area, public way, or open space with access to outside.

Normally, a workplace must have at least two exit routes to permit prompt evacuation of employees and other building occupants during an emergency. More than two exits are required, however, if the number of employees, size of the building or arrangement of the workplace will not allow employees to evacuate safely. Exit routes must be located as far away as practical from each other in case one is blocked by fire or smoke.

Figure 18: Emergency Exit/Escape Route Signages

4.8 First aid signage:

First aid: is the assistance given to any person suffering illness or injury. With care provided to preserve life, prevent the condition from worsening, or to promote recovery. It includes initial intervention in a serious condition prior to professional medical help being available.

Safety shower signage: The safety signage of first aid is posted on the first aid kit. A safety shower is a unit designed to wash an individual's head and body which has come to contact with hazardous chemicals. Large amount of water is used and a user may need to take off any clothing that has been contaminated with hazardous chemical. The safety signage of safety shower is shown below:

An eyewash station: Is a unit for washing chemicals or substances that might splash into the individual's eyes before he or she can seek further medical attention.

- The path from the hazard to the eyewash or eye/Face wash shall be free of obstructions and tripping hazards.
- Eyewash station shall flush both eyes simultaneous within gauge guideline.

- Eye or eye face wash shall provide a controlled flow of water that is non-injurious to the user.
- Eye or Eye/Face wash stations should have highly visible and well-lit signage.

Figure19: First Aid Signage

5.0 Training:

Training means helping people to learn how to do something, telling people what they should or should not do, or simply giving them information. Providing health and safety information helps you to:

- Ensure that people who work for you know how to work safely and without risks to health
- Develop a positive health and safety culture, where safe and healthy working becomes second nature to everyone
- Meeting your legal duty to protect the health and safety of your employees

Effective training:

- Will contribute towards making the employees competent in health and safety;
- Can help the business avoid the distress that accidents and ill health Cause.
- Can help to avoid the financial costs of accident and Occupational ill health.

5.1 Training of organization:

Training of an organization need to decide that what training of your organization needs?
The following steps of training of the organization are listed below:

- Identify the skills and knowledge needed for people to do their job in a safe and health way. Compare these against people's current skills and knowledge and identify the gaps.
- Review the experience of injuries, near misses or cases of ill health.
- There should be proper focus on risk assessments to see where information and/or training have been identified as factors in controlling risks.
- Consider awareness training needs for everyone, including directors, managers and supervisors, including:

  - How you manage health and safety
  - Who is responsible for What?
  - The cost to the business if things go wrong
  - How to identify hazards and evaluate risks
  - The hazards encountered and measures for controlling them

5.2 Training priorities:

Training to any organization should have some priorities which are listed below:

- Those where lack of information and/or training might result in serious harm
- Those that benefit the largest numbers of staff
- New recruits or those new to the working environment
- People changing jobs, working practices or taking on new responsibilities
- People using new equipment
- Consult employees or their representatives for their views

5.3 Monitoring of working of training:

Monitoring of working of training should be maintained properly. Following steps of monitoring of training are listed below:

- Do your employees understand what you require of them?
- Do they now have the knowledge and skills needed to work safely and without risk to health?
- Are they actually working as they have been trained to?
- Has there been any improvement in your organization's health and safety performance?
- What feedback are you getting from line managers and the people who have been trained?
- Are further information and/or training needed?
- The training records should be monitor so that refresher training can be given when needed

5.4 Awareness of sign boards :

Awareness of signage boards is a major part of training. Safety signage is crucial in any work environment. The primary importance of displaying safety signage is to prevent injury and ensure staff and visitors are well aware of all possible dangers and hazards ahead in certain situations and/or environment.

Signage: Is the design or use of signage and symbols to communicate a message to a specific group, usually for the purpose of health and safety. The main purpose of signage is to communicate, to convey information designed to assist the receiver with decision-making based on the information provided.

6.0 References

- Queensland Work Health and Safety Regulations 2011
- ISO 3864 Graphical Symbols-Safety colors and safety signs-Part 1: Design principles for safety signs and safety markings,2004,2011
- Workplace Safety Signs, Labels, Tags and Markings Resource Guide, Clarion Safety Systems, 2013
- OSHA 29 CFR, 1926.503 Training Requirements
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ADNOC – HSE Management System Guidelines
- AS/NZS 1319:1994 Safety Signs for the Occupational Environment

Attached Documents

- HSE-FRM-041:Fire Prevention Checklist

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

PERSONAL PROTECTIVE EQUIPMENT (PPE'S) MANAGEMENT

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

The objective of this procedure defines requirements and guidelines for the selection, use and maintenance of Personal Protective Equipment (PPE) at all SABQ Projects. This procedure also establishes guidelines that ensure adequate selection, provision, use, maintenance and enforcement of use of PPE for contractor and its subcontractor personnel.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of SABQ Energy Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

BS: British Standard

EN: European Norm

PVC: Polyvinyl Chloride

RPE: Respiratory Protective Equipment

UV: Ultraviolet

CE Marking: Conformity Europeans is a certification mark that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area (EEA). The CE marking is also found on products sold outside the EEA that are manufactured in, or designed to be sold in, the EEA.

Decibel: It is a unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale.

Dermatitis: A medical condition in which the skin becomes red, swollen, and sore, sometimes with small blisters, resulting from direct irritation of the skin by an external agent or an allergic reaction to it.

Donning: The act of putting on/wearing the protective equipment on body face mask, face shield etc. is called as donning

Doffing: The act of putting off the protective equipment is known as doffing.

Fume: A fume or fumes refers to vapors (gases), dusts and/or smoke given off by a substance as a result of a chemical transformation such as reaction, heating, explosion or detonation. "Fumes" generally conveys the idea that the cloud is an irritating, hazardous and/or toxic substance.

Impact: The force with which moving or falling object hits a person is the impact of that object to the person. Impact is usually considered as a forceful contact or collision.

Impairment: It is a disability that limits a person's physical capacity to move, coordinate actions, or perform physical activities. It is also accompanied by difficulties in one or more of the following areas: physical and motor tasks, independent movement; performing daily living functions.

Non-Conductive Material: All the material that do not let the flow of heat, electricity or sound form one point to another is known as non-conductive material.

Personal Protective Equipment: Any device or appliance designed to be worn or held by an individual for protection against one or more health and safety hazards.

Pinch Point: A point in between moving and stationary parts of a machine where an individual's body part may become caught, leading to injury.

Positive Pressure: It is a pressure within a system that is greater than the environment that surrounds that system. Consequently, if there is any leak from the positively pressured system it will egress into the surrounding environment. Most RPE are made on positive pressure phenomena.

SCBA: A **self-contained breathing apparatus** (**SCBA**) sometimes referred to as a compressed air breathing apparatus (CABA), is a device worn by rescue workers, firefighters, and others to provide breathable air in an immediately dangerous to life or health atmosphere (IDLH).

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Shall be responsible for the provision of all necessary safety equipment to execute the works safely, and has to ensure that PPE is maintained in a "good" condition.
- Shall be responsible to ensure that PPE is inspected as required.
- Shall be responsible to ensure that accidents related to PPE's are reported, investigated and that corrective and preventive measures are taken.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.

- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 HSE Lead (Head Office/Project Sites/Workshop)

- Shall be responsible to ensure daily inspection to properly ensure that PPE requirements are met, and specific PPE requirements are strictly followed.
- Shall be responsible to lead by example and ensure their required PPE are worn and in "good" condition.
- Shall be responsible to ensure that proper training is conducted, toolbox talk conducted and Job Safety Analysis (JSA) is applied.

3.6 Job Supervisors

- Shall be responsible to ensure that PPE's as per Job Safety Analysis (JSA) are properly implemented.
- Shall be responsible to ensure that their workers are provided with adequate PPE, and "bad" or "worn" PPE are replaced as and when required.
- Shall be responsible to ensure that workers strictly comply with PPE requirements for site, and lead by example in this regard.

3.7 Site Employees

- Shall be responsible for signing for any personal protective equipment issued to them and shall ensure that it is used as required.
- Shall be responsible for maintaining and using the correct PPE while performing their task and complying with HSE rules and regulations and immediately reporting "bad" or "worn" PPE to their supervisors to ensure maintenance or replacement is done.
- Shall be responsible to perform daily and pre-task inspections on all applicable PPE.

4.0 Procedure

The basic PPE to be worn by all site personnel at all times are a safety helmet, safety glasses with side protection (panniers), steel toe capped safety footwear and overalls (100% cotton only or fire resistant). Frequent inspection of PPE shall be carried out and recorded on **Annexure A: Personal Protective Equipment Inspection Checklist**. Any specific PPE requirements will be detailed in the Method Statement and/ or Risk assessment relevant to the job being performed.

Helmets are to be worn as designed; wearing and rigging the helmet to facilitate the rim facing backwards will not be tolerated and is in violation of this PPE Procedure.

All PPE used on site shall as a minimum have the CE marking. Noncompliance to PPE requirements will result in disciplinary action.

4.1 Head Protection

4.1.1 General

Safety Helmets/ Hard hats protect the wearer against head injuries caused by falling objects, blows or other impacts. The helmet gives some protection against splashing by liquids. It should be manufactured from plastics.

The following are examples of activities and processes involving risks of falling objects or impacts, which may require the provision of head protection:

- Building work, work on (or near) scaffolding and demolition work.
- Work in pits, trenches, shafts and tunnels.
- Work with bolt-driving tools.
- Blasting work.
- Work near hoists, lifting plant, cranes and conveyors.
- Work with containers, machinery, silos, storage bunkers and pipelines.
- Transport activities involving a risk of falling material.
- Work from suspended access systems, etc.

Head protection shall fit properly and be comfortable. Personnel requiring head protection shall be provided with instruction on its use and maintenance including, where appropriate, compatibility with other types of PPE.

Helmets are required to be replaced if subjected to severe impact. The use of paint (aerosol type) may affect the integrity of the helmet and should not be allowed. Metal safety helmets shall not be worn.

4.1.2 Selection

There are three types of head protection used widely in industry:

- Industrial safety helmets that can protect against falling objects or impact with fixed objects.
- Industrial scalp protectors (bump caps), which can protect against striking fixed obstacles, scalping or entanglement.
- Caps, etc. that can also protect against scalping/entanglement.

All personnel entering PROJECT workplaces where a risk of head injury may exist shall wear safety helmets.

Industrial Helmets

4.1.3 Special Requirements

Welding Helmets/ Caps

Welding helmets/caps, which give protection against dangerous arc radiation and hot particles of weld metal, shall be worn when engaged in welding operations. It is important to note that welding helmets should provide adequate head protection at the same time, or should be compatible with safety helmets/ hard hats.

Welding Helmets

4.1.4 Care and Maintenance

Safety helmets must be properly cared for and maintained by:

- Storing them in a safe place when not in use, for example on a peg or in a cupboard.
- Visually examining them regularly for signs of damage or deterioration.
- Replacing defective harness components.
- Regularly cleaning or replacing the sweat band.

All safety helmets are susceptible to loss of strength and impact resistance from ultraviolet light, temperature extremes and chemical degradation. An inspection and maintenance program that includes provision for replacement should be established.

The service life of a safety helmet can be extended by cleaning both the shell and harness as part of the maintenance program. These parts can be scrubbed with a mild detergent (not soap) to remove dirt and stains, rinsed thoroughly with warm water (40° C), wiped dry and then inspected for any signs of damage. This should also be carried out before issuing a used safety helmet to another person.

4.1.5 Color Coding

Safety Helmets will be color coded to easily differentiate between different disciplines and staff levels. The following color coding will be applied:

- Management Staff: White Helmet
- Job Supervisor: White Helmet
- HSE Staff: Green Helmet

- Rigger Staff: Red Helmet
- Labor Staff: Yellow Helmet

4.1.6 Codes and Standards

Helmet standard shall comply with EN *397 - Industrial Safety Helmets*

Other Relevant standards for protective headgear are:

- EN 443:1997 Specification For Protective Helmets For Fire-fighters;
- EN 812:1997 – Industrial Bump Caps.

4.2 Eye Protection

4.2.1 General

Eyes can be damaged by dust particles, fumes, liquids and certain types of light (e.g. lasers, welding flash, and ultra-violet). Protection may take the form of:

- Shatter-proof spectacles.
- Various types of goggles.
- Face shields.
- Visors.
- Various types of tinted glasses.

The lenses of eye protectors shall be kept clean as dirty lenses restrict vision, which can cause eye fatigue and lead to accidents.

4.2.2 Selection

The selection of eye protection depends primarily on the hazard. However, comfort, style and durability must also be considered.

- Safety spectacles are similar in appearance to prescription spectacles but may incorporate optional side shields to give lateral protection to the eyes.
- Eye shields are like safety spectacles but are heavier and designed with a frameless one-piece molded lens. Vision correction is not possible as the lenses cannot be interchanged. Some eye shields may be worn over prescription spectacles.
- Safety goggles are heavier and less convenient to use than spectacles or eye shields. They are made with a flexible plastic frame and one-piece lens and have an elastic headband. Safety goggles are more prone to misting than spectacles. Double glazed goggles or those treated with an anti-mist coating may be more effective where misting is a problem. Where strenuous work is done in hot conditions, 'direct ventilation' goggles may be more suitable. However these are unsuitable for protection against chemicals, gases and dust. 'Indirect ventilation' goggles are not perforated, but are fitted with baffled ventilators to

prevent liquids and dust from entering. Indirect ventilation goggles will not protect against gas or vapor.

- Face shields are heavier and bulkier than other types of eye protector but are comfortable if fitted with an adjustable head harness. Face shields protect the face but do not fully enclose the eyes and therefore do not protect against dusts, mist or gases. Visors on brow guards or helmets are replaceable. They may be worn over standard prescription spectacles and are generally not prone to misting. Face shields with reflective metal screens permit good visibility while effectively deflecting heat.
- Face shields must not interfere with the wearing of a hard hat and are not a replacement for the requirement to wear safety glasses or goggles but a supplement to these.
- Glare filters or sunglasses: UV Protection for Eyes. Wearing suitable glare filters protects the eyes from UV flash from welding and allied processes. Sunglasses protect the eyes against the sun's harmful.
- UV rays. Exposure to the sun's UV radiation can lead to a sunburn-like condition called photo keratitis, which is normally a temporary, but uncomfortable, condition. Long-term exposure to the sun's harmful invisible rays can speed up ageing of the macula, the focusing part of the retina, and can also lead to cataracts. It is important therefore to specify and/or buy sunglasses that meet minimum standards for protection. Sunglasses must conform to British Standard BS EN 1836:1997.
- The wearing of tinted or sunglasses inside buildings, structures or tanks where lighting may be limited is strictly prohibited. This practice reduces visibility and increases susceptibility to accidents.

Eye Protection

4.2.3 Special Requirements

Corrective Lenses

Personnel wearing corrective lenses require the same level of eye protection as those without corrective lenses. A specially designed cover safety glass is to be worn on top of the corrective lenses. Impact resistance corrective lenses with side shields may be used for general purpose.

Welding Operations (Eye, Face and Neck Protection)

Welding operations require special eye, face and neck protection for the operator. Assistants, Firewatchers will also require protection against ultra-violet radiation.

Welding Neck Protection

Safety Goggles/ Face Shields

Certain operations are significantly more hazardous to the eyes, and the eye protection selected must be suitable against particular hazard in question. For operations including grinding, scraping, chipping, handling of chemicals and solvents, sample taking, etc., advice should be sought from the HSE Department. Full-view goggles/face shields may be required and they should be suitable for dust or chemical protection.

4.2.4 Care and Maintenance

The lenses of eye and face protectors must be kept clean as dirty lenses restrict vision, causing eye fatigue and leading to incidents.

Scratched or pitted lenses should be replaced as they may impair vision and their resistance to impact may be impaired. Transparent face shields should be replaced when warped, scratched or brittle with age.

Eye protectors shall normally be issued on a personal basis and used only by the person they are issued to. If eye protectors are re-issued for any reason, they shall be thoroughly cleaned and disinfected. Eye protectors shall be protected by being placed in suitable cases when not in use. Eye protector headbands shall be replaced when worn out or damaged.

4.2.5 Codes and Standards

Welding shields must be suitable for protection against molten metal and hot particles and conform to the requirements of BS EN 175: 1997 Personal protection: equipment for eye and face protection during welding and allied processes, or an equivalent specification. It must be used in conjunction with appropriate welding filter – BS EN 169 or EN 379).

Other relevant standards for eye protection are as follows:

- BS 1542:1982 Specification for Equipment for Eye, Face and Neck Protection against Non- Ionizing Radiation Arising During Welding and Similar Operations.
- EN 165 Personal Eye Protections: Vocabulary.

- EN 166 Personal Eye Protections: Specifications.
- BS EN 169:1992 Filters for eye protectors used in welding and similar operations.
- BS EN 172: 1995 Specification for Sun glares Filters Used in Personal Eye Protectors for Industrial Use.
- BS EN 175:1997 – Eye and Face Protection during Welding and Allied Processes.
- BS EN 379:1994 Specification for Filters with Switchable or Dual Luminous Transmittance for Personal Eye-Protectors Used in Welding and Similar Operations.
- EN 465:1995 / BS EN 466-1:1995- Protective clothing against liquid chemicals. Performance requirements for chemical protective clothing with spray-tight connections between different parts of the clothing.
- EN 467:1995 - Protective clothing against liquid chemicals. Performance requirements for garments providing protection to parts of the body.
- BS EN 1836:1997, Personal eye protection - Sunglasses and Sun glare filters for General Use. British Standards Institute 1997.
- BS EN 170: Specification for Ultra Violet filters.

4.3 Hand Protection

4.3.1 General

Gloves of the appropriate type shall be worn to prevent damage to the hands. The correct type for wear depends upon whether the hazard is from:

- Rough or sharp objects;
- Hot objects;
- Oils, solvents, corrosive substances and chemical contamination.

Gloves themselves can become a hazard if not in good condition as they can become caught in machinery, and loose-fitting, wet or oily gloves do not provide a good safe grip.

Care shall be taken in the donning, use, removal and storage of protective gloves. They shall be maintained in good condition, checked regularly and discarded if worn or deteriorated.

The gloves shall be a good fit, leaving no gap between the wearer's sleeve and the glove itself. If there is a danger of chemicals entering the glove at the cuff, armlets shall be worn. Gloves shall be maintained in accordance with the manufacturer's instructions.

Contact between the gloves and chemicals shall be kept to a minimum as the physical characteristics of a glove can be altered by some chemicals and may lead to the impairment of its protective properties.

Chemicals shall not be allowed to come into contact with the skin.

4.3.2 Selection

Table 1 below recommends the most suitable glove materials to protect wearers from exposure. The importance of using material depends on the extent of the exposure.

The table should be referenced when working with different materials.

Type of Gloves	Picture	Usage
Cotton/disposable/Kevlar		Give minimal protection to hands but can avoid contaminations and liquid absorption into the skin.
Nitrile/PVC Dipped Gloves		Provide excellent protection when dealing with oil and lubricants.
Leather gloves		Provide protection from elements as well as scrapes. Best used when handling bricks, metal and woods.
Cut Resistant Gloves		Should be worn when handling tools, material that could easily cut skin.
Electrical Gloves		Should be used while working with electrical lines and equipment. Provide electrical insulation.

Table 1: Safety Gloves

4.3.3 Special Requirements

Approved safety gloves must be worn for specific types of exposure;

Leather Rigger Gloves

Leather rigger gloves are required to be carried by all members of the crew, carrying out heavy duty lifting work.

Chemical Handling (PVC/Neoprene Gloves)

Particular care should be taken when handling chemicals, which must not come into contact with the skin. PVC gloves for handling acids/alkalis should be worn. Special gloves are available (Nitrile) for handling solvents. Handle and remove gloves carefully to avoid contamination of hands and inside the gloves.

Wash hands and arms frequently, dry them carefully and use a hand cream to prevent dryness of the skin through loss of natural oils. Keep cuts and abrasions covered with waterproof plasters.

Kevlar Gloves

These gloves are worn as a preventive measure against major hand injuries, cuts, abrasions, and scrapes. Kevlar gloves are suitable for working with glass, metal, wire and other sharp objects. These gloves may also resist organic solvents and diluted acids. Some designs are washable and breathable.

Kevlar brand fibers provide strength at high temperatures, which makes it appropriate for gloves and mittens used in high heat applications. The fiber of the glove is inherently flame-resistant, and unlike nylon, polyester and polyethylene, it will not melt, burn or support combustion in the air, ignite, or conduct electricity.

There are several types of Kevlar gloves that are flame-resistant, useful for work in the welding field.

One drawback to Kevlar is that it can be broken down by ultraviolet light, so it cannot be used in areas where there would be constant, long-term exposure to the sun.

Electrical Work (Electric Gloves / Power Isolation Gloves)

Wear approved Electric gloves while working on live electric equipment, however after the power is isolated and proven dead, general purpose gloves can be used.

4.3.4 Care and Maintenance

Where tests show that penetration through a glove can occur, a control system of regular glove checking, cleaning and replacement must be put in place.

Gloves are to be regularly examined for cuts, punctures, abrasion, cracks, contamination, etc. Areas between the fingers and other flex points must be carefully examined. Other gloves may be tested for leaks by inflating with low-pressure air (200 kpa) and immersing in a water bath while still under pressure.

Although it may be practical to decontaminate and re-use gloves in certain situations, the cleaning process usually does not remove all the toxic material, thus reducing breakthrough time for subsequent use. Discarded and contaminated gloves are to be destroyed in order to prevent unauthorized retrieval and use (this is especially important for gloves that may have been in contact with very toxic substances.)

Gloves should be stored at ambient temperatures away from light, moisture, solvents and chemicals. Each person should be issued with protective gloves on a personal basis to prevent the spread of contagious skin infections.

If rubber gloves for electrical work become dirty or soiled, they can be cleaned by washing with soap and water at a temperature not exceeding the glove manufacturer's recommended limit, then thoroughly dried and dusted with talcum powder. If insulating compounds such as mastic or paint continue to stick to the gloves, the affected parts should be sparingly wiped with a suitable solvent and re-cleaned. They may then be returned to their storage box or pouch.

4.3.5 Codes and Standards

Gloves suitable for general industrial use shall conform to the specifications contained in BS EN 420 -BS EN 420:1994 General Requirements for Gloves.

Gloves suitable for personnel working with electricity shall conform to BS EN 697 - BS 697, 1986, Specification for Rubber Gloves for Electrical Purposes. Gloves shall be rated for the voltage of the equipment to be worked on.

Heat resistant gloves shall be worn during welding and they shall conform to BS EN 407 - BS EN 407:1994 Protective glove against thermal risk (heat and or fire).

Other Relevant Standards for hand protection are:

- BS EN 388:1994 – Protective gloves against mechanical risks.
- BS EN 374 (Parts 1 To 3) Protective Gloves Against Chemicals and Micro-Organisms [13].
- BS EN 388:1994 Protective Gloves against Mechanical Risks [14].
- BS EN 421:1994 Protective Gloves Against Ionizing Radiation to Include Irradiation and Contamination.

4.4 Foot Protection

4.4.1 General

Safety footwear protects against hazards ranging from dermatitis to crushing injuries. Within this broad range of hazards, consideration needs to be given to the possibility of contact with chemicals, extremes of heat, slippery surfaces, punctures from nails or other sharp objects, and electrical hazards both live and static. All personnel working in or visiting, potentially hazardous areas such as construction sites, workshops, process areas, etc. must wear safety footwear at all times while in the area.

The following are examples of activities involving risks to the feet.

Construction: Work on building and demolition sites will usually require safety footwear to protect the feet from falling objects, objects dropped by the handler, tripping accidents and wheels running over feet.

Mechanical and Manual Handling: There may be a risk of objects falling on or crushing the front of the foot. There may be a risk of a fall through slipping which could result in damage to the heel on impact.

Electrical: People who work where there are flammable atmospheres shall wear anti-static footwear to help prevent ignitions due to static electricity.

Thermal: Work in hot conditions requires footwear with heat-resistant and insulating soles.

Chemical: Footwear provided when working with hazardous chemicals shall be both impermeable and resistant to the attack by chemicals.

Welding: Select boots that meet the safety requirements during welding operations. There is an increased risk from sparks and molten metal and slag.

Look for a compliance mark inside boot. Wear leather, steel-toed, high-topped boots in good condition. They protect feet and ankles from injury. In heavy spark or slag areas, use fire resistant boot protectors or leather spats strapped around pant legs and boot tops to prevent injury and burns.

4.4.2 Selection

The selection of foot protection depends primarily on the nature of the hazard. However, comfort, style and durability also need to be taken into account. The choice shall be made on the basis of compatibility with the work, degree of protection afforded, and the requirements of the user.

Generally, safety footwear shall be flexible, wet resistant and absorb perspiration. Boots are required where ankles need protection. The ability of the footwear to resist corrosion, abrasion and industrial wear and tear must also be considered. The manufacturer's instructions and markings for appropriate use and level of protection shall always be followed.

The key features of safety footwear which shall be considered in selection are:

Soles: Work shoes and boots shall have treaded soles for slip-resistance. Soles can be heat and oil resistant, slip resistant, shock resistant, anti-static or conductive.

Steel Toe-Caps: They shall be capable of resisting a heavy sharp object falling from a considerable height.

Heat Resistance: Leather or other heat resistant materials can be used in safety footwear to offer protection against heat, sparks and molten metal. Leather spats are often employed to protect from these extremes.

Waterproofing: People working in wet places shall wear safety footwear impervious to water. Rubber and PVC are suitable waterproofing materials for footwear because they are

not permeable. There are 'breathable materials' which are water resistant, but which also allow air to get through and perspiration to get out, and may therefore be more comfortable and more hygienic.

Anti-static: Footwear offers protection against the hazard of static electricity and gives some protection against mains electric shock. Anti-static footwear to be worn where there is both a hazard from static build up and the possibility of contact with mains electricity. The soles needs to have a resistance low enough to allow static electricity to leak slowly away while maintaining enough resistance to protect against a 240 V mains electric shock.

4.4.3 Special Requirements

Safety Shoes/ Boots

These are the most common types of safety footwear and normally comprise rubber soles and leather uppers with integrated steel toecaps. They may also have features such as slip resistant soles and steel mid-soles.

Safety Shoes

Rubber Boots

These protect against water and wet conditions and are useful in jobs where the footwear needs to be washed and disinfected for hygienic reasons, such as in food handling. Usually made from rubber, they are also made from polyurethane and PVC that have greater chemical resistance. Rubber boots are available with steel toecaps and instep guards.

Rubber Boots

Conductive Footwear

It also prevents the buildup of static electricity. It is particularly suitable for handling sensitive components or substances. It gives no protection against electric shock.

Conductive Safety Shoes

Leather Spats

These are to be used by welders to provide extra protection to feet and ankles from sparks, molten metal and extremely hot slag.

Leather Spats for Welder

4.4.4 Care and Maintenance

Safety footwear must be maintained in good condition, checked regularly and discarded if worn or deteriorated. Bootlaces are to be checked and replaced if necessary. Materials lodged in the sole tread should be removed without further damaging the tread. Stitching should be checked for loose, worn or cut seams.

Protective silicone sprays or waxes may be used to give protection against wet conditions.

4.4.5 Codes and Standards

Relevant Standards for foot protection are:

- BS EN 345-1:1992 Specification for Safety Footwear for Professional Use.
- BS EN 346-1:1992 and BS EN 346-2:1996 Specification for Protective Footwear for Professional Use.

- BS EN 347-1 and BS EN 347-2:1996 Specification for Occupational Footwear for Professional Use.

4.5 Body Protection

4.5.1 General

During normal day-to-day construction work, body protection such as overalls shall be used. This is one of the mandatory PPE requirements to enter the Construction site. These are adequate to provide protection against dirt, grime, small oil splashes, minor abrasions and burns etc.

Standard overalls with long sleeves shall be used by all personnel, which are made of 100% cotton. No polyester cotton blends will be allowed.

Unique colored overalls shall be used by contractor and its Subcontractor, with at least the Company's name printed on the overall. Contractor has selected a light blue overall with a blue strip across the shoulders for its labor and the same color for its Supervisors, but in a two piece.

4.5.2 Selection

The following factors should be considered when selecting overalls.

- Chemical and hazardous substances protection required
- Protection from Fibers and Dust required
- Foul weather protection required
- Protection from fire, sparks & welding debris

4.5.3 Special Requirements

Protection from chemicals and hazardous substances

- Low Risk Chemicals can be protected against by wearing chemical-resistant clothing.
- Strong Solvents, Oils and Greases require heavier protection afforded by coats, overalls and aprons made from neoprene or polyurethane coated nylon, or Terylene or rubber aprons.
- Chemical Suits protect against more potent chemicals. They are totally encapsulating suits which are either vapor-proof or liquid-splash proof and are fed with breathable air. Chemical suits have a life expectancy of three to four years and must be inspected every three months even if not in use. This entails an air test and looking at all of the seams.
- Vapor Suits protect against hazardous vapors. They must be air-tested with the manufacturer's test kit, before being stored in a protective case. Manufacturers of vapor proof suits generally provide a testing and repair service.
- Splash-Resistant.

Chemical Suit

Vapor suit

Fibers and Dust

Protection can be obtained by wearing suits made from bonded olefin, which keeps out fibers and particles.

Disposable Fiber Suit

Foul Weather Duties

These garments give protection against wind, and rain, and some protection against splashing from liquids. The clothing will offer a degree of protection if the wearer is inadvertently exposed to a fire situation. The garment shall be manufactured from approved materials.

Foul Weather Coverall

Protection from fire, sparks & welding debris

Special consideration must be taken when working in hazardous environments where hydrocarbons are present. Cotton will provide some protection in the event of a fire; however fire resistant coveralls are preferred and may be a requirement of an area that work may take place. There is also an extreme hazard when welding, due to slag molten metals and sparks generated during welding and cutting operations. In these cases leather or other resistant aprons or welding clothing is required on top of regular coveralls to provide adequate protection.

Flame Resistant Coverall

4.5.4 Care and Maintenance

All types of body protective clothing and equipment must be maintained in good condition and checked regularly. It must be repaired or discarded if damaged. General-purpose coveralls should be regularly laundered to prevent irritation and the spread of skin infections. Coveralls that are damaged or torn must be repaired or replaced.

Chemical suits should be washed in warm water and a mild soap whenever they have come into contact with chemicals. Suits should be hung up to dry before being stored in cases or hung on hangers. Chemical suits have a life expectancy of three to four years and must be inspected and tested every three months, even if not in use. The inspection and testing must include an air test with examination of all seams for leakage.

Vapor suits must be air tested, after use and cleaning, with the manufacturers test kit before being stored in a protective case. Where available and when necessary, the manufacturer's testing and repair services should be used.

4.5.5 Codes and Standards

Relevant Standards for protective Clothing are:

- BS EN 366:1993 Protective Clothing. Protection against heat and fire. Method of Test: Evaluation of materials and material assemblies when exposed to a source of radiant heat.
- BS EN 367: 1992 Protective Clothing. Protection against heat and flames. Test Methods. Determination of heat transmission on exposure to flame.
- BS EN 368:1993 Protective Clothing: Protection against liquid chemicals: Resistance of materials to penetration by liquids.

- BS EN 464:1994 Protective Clothing for use against liquid and gaseous chemical including aerosols and solid particles. Test Method. Determination of leak-tightness of gas-tight suits (Internal Pressure Test).
- EN 465 Protective Clothing: Protection against liquid chemicals: Performance Requirements: Type 4 Equipment: Protective suits with spray-tight connections between different parts of the protective suit.
- BS EN 468:1995 Protective Clothing for use against liquid chemicals. Test Method. Determination of resistance to penetration by spray (Spray Test).
- EN 469 Protective Clothing for Fire-Fighters.
- EN 470 Protective Clothing for use in welding and similar activities.
- BS EN 471:1994 Specification for high-visibility warning clothing.

4.6 Hearing Protection

4.6.1 General

Where personnel experience a daily personal noise exposure of greater than 85dB (A), then ear protection shall be provided. Where area noise surveys indicate noise levels of greater than 90dB (A), signs shall be posted to indicate that each high noise area has been designated an Ear Protection Zone and ear protection shall be worn in these areas. Personnel working in an Ear Protection Zone, or in an area where there is a likelihood of very loud impulsive noise, shall be provided with ear protection and trained to use it.

Information, instruction and training on the use of ear protection shall include:

- The duty of personnel to wear appropriate ear protection in high noise level environments.
- The damage that can occur to hearing through noise exposure.
- How to fit ear protection properly, and use it with other PPE.
- The importance of using ear protection at all times, so that its effectiveness is not compromised.
- The reductions in effectiveness caused by long hair, earrings, hats etc., particularly if these become caught between the seal of an earmuff and the head.

No exposure to continuous or intermittent noise above 115dB (A) is permitted under any circumstances.

Guidelines for recommended permissible exposure time for continuous time weighted average noise, according to OSHA is given in **Table 2** blow. For every 5 dB sound pressure level (SPL) over 85 dB, the permissible exposure time is cut in half − before damage to our hearing can occur.

OSHA Standards		
Sound Level (dB)	**Duration (Hours:Minute:Seconds)**	**Damaging Effect**
85	16:00:00	Annoying. Damage begins after long term exposure.
90	8:00:00	
95	4:00:00	
100	2:00:00	Loud and uncomfortable. Loss of hearing with continuous exposure.
105	1:00:00	
110	0:30:00	
115	0:15:00	
120	0:07:30	
125	0:03:45	
130	0:01:53	Painful and irreversible damage.
135	0:00:56	
140	0:00:28	Painful and traumatic injury (irreversible hearing loss).
145	0:00:14	
150	0:00:07	
155	0:00:03	
160	0:00:01	

Table 2: Permissible Exposure Limits to Sound Levels and Its Effects

4.6.2 Selection

Ear protection shall be hygienic, and shall not interfere with other PPE. For example, ear plugs shall be chosen in circumstances where another item of PPE, such as safety glasses, would interfere with the seal of ear muffs and consequently reduce their effectiveness.

Comfort is an important consideration. Where possible, personnel shall be offered a choice of appropriate ear protection so they may select which type suits them best. Disposable ear protection may be preferable to re-usable in certain circumstances.

4.6.3 Special Requirements

The following types of hearing protection are available:

- **Earplugs**, which fit into the ear canal.
- **Semi-inserts or canal caps** which cover over the entrance to the ear canal.
- **Earmuffs**, which completely cover the ear.
- **Enclosures**, which encase the entire head.

Ear Plugs

Ear Muffs

Semi-inserts

4.6.4 Care and Maintenance

Ear protection shall be checked daily to ensure it remains clean, and in good condition. Replace compressible earplugs that are no longer soft and pliable and earmuffs where the seals show signs of damage. Check that headbands remain tight, and replace headbands that are worn out or damaged.

Earplugs and semi-inserts (canal caps) shall be issued on a personal basis and used only by the person they are issued to for hygiene reasons. Re-useable ear protection shall be thoroughly cleaned and disinfected after use, and stored in a suitable case when not in use.

4.6.5 Codes and Standards

Other relevant standards for ear protection are as follows:

- BS EN 352-1: 1993 - Hearing Protectors – Ear muffs.
- BS EN 352-2:1993 - Hearing Protectors – Ear plugs.
- BS EN 352-3:1997 - Hearing Protectors – Ear muffs attached to a safety helmet.
- BS EN 352-4:2004 - Hearing Protectors–Ear muffs attached to a safety helmet as for BS EN 352-1.

4.7 Respiratory Protection

4.7.1 General

Personnel may be exposed to harmful vapors, dust and other airborne contaminants by the design or operating procedures of the worksite, in these circumstances it will be necessary to provide Respiratory Protective Equipment (RPE) to personnel. This will be identified as one or more of the control measures after conducting a task risk assessment (Information Material Safety Data Sheet).

It will be necessary to correctly identify the respiratory hazards, smokes, the product of combustion, dust, abrasion material, liquids, gases, vapors from chemicals, solvents, etc. The concentration and combination of the harmful substances should be assessed for their degree of toxicity. Advice the selection of RPE for particular applications can be sought from HSE Section.

Prior to the selection of suitable RPE, due consideration should be given to potential face-fit problems, including the wearing of facial hair. Full beards are not permitted for staff that may be required to wear respiratory protection during their normal working day, in particular, self-contained breathing apparatus for firefighting, rescue or H_2S escape.

Respiratory protection may be required for normal working conditions or emergency conditions and fall into two general categories:

- Those providing air which must pass through a filtering mechanism (referred to as respirators).
- Those providing an air supply from an uncontaminated source (referred to as breathing apparatus).

Note: It is important to remember that filtration respirators are unsuitable for atmospheres which are deficient in oxygen.

The following concentrations of contaminants shall not be exceeded:

Containments	Concentration
Oil Mist	0.5 mg/m^3
Carbon Dioxide	500 ppm
Carbon Monoxide	5 ppm

Table 3: Maximum Concentration of Containments in Air

The air must be free from all odor and contamination by dust, dirt or metallic particles and shall not contain any other toxic or irritating ingredients. It shall also be at a temperature which operators find comfortable.

The following facts should be considered when carrying out work with RPE. With all these types of apparatus it is essential to ensure correct adjustment of the retaining straps to give proper fitting and thus prevent the ingress of harmful contaminants.

- Breathing apparatus for work in confined areas shall be selected after consideration of the working conditions.
- All lifesaving PPE shall be inspected on monthly basis and records shall be retained.
- It must be emphasized that respirators are only designed to afford protection against relatively low concentrations of toxic substances, and if there is doubt as to the correct level of protection that is required, then the higher level of protection will be selected. This may mean that in certain circumstances a respirator is deemed to be inadequate and breathing apparatus is required.

4.7.2 Selection

As there are many types of RPE, care is needed to choose the right equipment for a particular situation. First Line Supervisors shall involve wearers in the selection process and, where possible, provide them with a choice of suitable RPE.

Where there is doubt over the selection of suitable RPE, contractor shall confirm with the manufacturer or supplier that the chosen equipment is suitable for the task and for the conditions in which it is to be used.

Color Code	Type	Use Against	Standards
White	P	Particles	European standard: EN 143
Brown	A	Organic gases and vapors, boiling point above 65 ºC	European standard: EN 14387
Grey	B	Inorganic gases and vapors	European standard: EN 14387 Do not use against CO
Yellow	E	SO_2 and other acid gases	European standard: EN 14387
Green	K	Ammonia and its organic derivatives	European standard: EN 14387
Red and White	Hg P3	Mercury	European standard: EN 14387 Maximum use time 50 hours Includes P3 particle filter
Blue and White	NO P3	Oxides of nitrogen	European standard: EN 14387 Includes P3 particle filter Single use only
Brown	AX	Organic gases and vapors, boiling point at or below 65 ºC	European standard: EN 14387 Single use only
Violet	SX	Substance as specified by the manufacturer	European standard: EN 14387

Table 4: Filter Type

4.7.3 Special Requirements

Principal types of RPE which may be used on special requirement by Client on the PROJECT are:

Dust Respirators

Dust respirators are usually of the filter type and provide protection against dusts that are not potentially dangerous.

Dust Mask/Respirators

Fine Dust Respirator (Catalyst Dust)

Dust respirators are used for fine dust (catalyst dust) during loading / unloading operations. These respirators provide reliable, effective protection against fine particulates, good for protection against airborne infectious diseases reduced heat build up to offer comfortable protection, particularly in hot and humid conditions.

Fine Dust Mask/Respirators

Cartridge and Canister Respirators

Cartridge and canister respirators are used in areas where there are heavier concentrations of dusts or vapors. They can be designed to give protection against specific hazardous chemicals, thus it is vital to ensure that the correct type is used for the risk involved.

Cartridge Respirators

Self-Contained Breathing Apparatus

Self-contained type breathing apparatus has a face-piece connected to a cylinder of compressed air and is for use in dangerous or toxic atmospheres. The duration of a cylinder is calculated on the basis of a rate of consumption of 40 liters per minute and then reduced by a safety factor of 10 minutes.

Self-Contained Breathing Apparatus

Supplied Air Breathing Apparatus

Supplied Air breathing apparatus has a face-piece connected to a source of uncontaminated air through a hose. This also is for use in dangerous or toxic atmospheres with the advantage over the self-contained type that the time a person can spend in an area is not limited by cylinder capacity. When using SABA personnel will have an escape bottle and appropriate training.

BA Trolley

4.7.4 Care and Maintenance

The performance of a tight-fitting face piece (filtering face pieces, half and full-face masks) depends on a good contact between the wearer's skin and the face-seal of the mask. For this type of equipment, a fit check needs to be performed each time the RPE is put on. Loose-fitting face pieces (hoods, helmets, visors, suits etc.) cannot be used in negative pressure equipment that relies on the wearer's lung power to draw in air. Maintenance of RPE is essential and shall include cleaning, disinfection, examination, repair, testing and record keeping. In addition, facilities for its safe storage shall be provided.

RPE shall not be modified in any way without the knowledge and consent of the manufacturer. Compressed breathing air used in RPE shall at least have:

- Oxygen content by volume of between 19.5 percent and 23 percent.
- Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less.
- Carbon monoxide content of 10 ppm or less.
- Carbon dioxide content of 1000 ppm or less.
- Lack of noticeable odor.
- Oxygen concentrations greater than 23 percent shall only be used in equipment designed for oxygen service

4.7.5 Codes and Standards

BS 4275 (Use and Maintenance of Respiratory Protective Equipment.) gives standards for breathing air quality.

4.7.6 Medical Fitness to Use Respirator

Respirators that use filters to prevent particulates or gases from being inhaled can increase the work of breathing during inhalation by up to 85 mm of water pressure. Resistance to the breathing increases as the filters become fouled during use. Expiratory effort is not as significantly affected by these respirators.

In contrast, air-supplied positive pressure respirators may require increased expiratory effort, as the user must breathe out against air pressure that is greater than normal. The extra respiratory effort increases as the rate of breathing increases with work activity.

Medical assessments of workers for respirator use should be performed:

- During pre-placement examinations for jobs where a respirator will or may be used;
- When a worker who is expected to use a respirator returns to work following major surgery or prolonged illness; and
- In conjunction with regular periodic medical surveillance or health examinations.

The examination should be directed towards the system and disorders covered in the functional inquiry and medical history, plus the background information about the intended use of the respirator. Special attention should be given to the skin and hair of the head and face, facial contour, and vision. Where special tests are indicated, they should be used. For example, pulmonary function tests, audiometric tests, tests for visual acuity, etc. may be useful in particular cases.

All persons required to wear any respirator during the course of their work shall receive a proper fit test performed by a competent person. The fit test and all training will be recorded and available for audit.

4.8 Fall Protection

4.8.1 General

Fall protection equipment shall be used when a worker may fall a vertical distance of 1.8 meters or more. Where a fall arrest harness is used they will be used in conjunction with a double lanyard and energy absorber fitted with an auto locking snap hook and will be visually inspected prior to use.

The principles of the use of fall protection equipment are summarized as follows:

- Any person at risk of a potential injury producing fall shall be secured by industry approved personnel fall arrest protection equipment.

A person suffering a fall when secured to a fall arrest system shall:

- Be subjected to an arresting force not exceeding 3.6KN (360kg).

- Be wearing equipment which will distribute fall arrest forces over the body in a way which minimize the possibility of injury, and
- Be connected to a system which will limit free fall to 1.8 m, to prevent the user from striking grade or objects that could cause injury, and will maintain the wearer in a survivable (head forward) post fall arrest position.

Personnel fall arrest equipment shall be installed in accordance with this procedure and applicable regulations. They shall be selected according to the hazards posed during the job and used per the manufacturer's instructions and their intended use.

All fall protection equipment must have manufacturer's labels that at a minimum bear the following Information:

- Manufacturer's name, address and contact details
- Date of manufacture
- Serial number
- Recognized certifying body (ANSI, EN, CE)

4.8.2 Selection

There are basically three types of fall protection systems to select. The selection will be based upon a Task Risk Assessment (JSA). The systems are:

- Travel restraint systems: Prevents a person from reaching a position from where a fall could occur.
- Work positioning systems: Provides a worker with continues tension thereby freeing both hands to be used for a task, i.e. reporting, photography, maintenance.
- Fall arrest systems: Does not prevent a fall from occurring in the first instance but arrests a fall after it has occurred.

The main types of fall arrest equipment are:

- Fall arrest harness (full body)
- Work positioning harness (full body)
- Cross Arm Straps (travel restraint only)
- Connectors (e.g. hooks, carabiners)
- Lanyard (with & without a shock absorber)
- Anchorage point
- Rope grabs (mechanical grabs)
- Retractable lanyards (inertia reel)
- Winching equipment
- Safety/ catch nets
- Beam clamps

4.8.3 Special Requirements

Full Body Harness

The full body harness provides a secure means of attaching the worker to the fall protection system and is designed to distribute the arresting forces encountered in a fall in a uniform and safe manner. The harness must be comfortable to wear, fit correctly, be free of defects, not hinder movement and bear the valid color coding.

Where a fall arrest harness is required, it shall be used in conjunction with a double lanyard fitted with an energy absorber attached to the dorsal D-ring on the back of the harness, by way of auto locking snap hook.

There are primarily two types of harnesses, namely the fall arrest harness and the work positioning harness. The fall arrest harness has a single rear D-ring attachment. The work positioning harnesses has multiple attachment points such as at the rear, front and sides of the harness.

Full Body Harness

Connectors (Snap Hooks)

Connectors are used to secure fall arrest system components such as lanyards, and energy absorbers to a workers fall arrest harness. Where connectors are attached to fall protection systems they must be;

- Drop forged
- Rust resistant
- Free of sharp edges
- Auto locking design (requires a double action to open).
- Have minimum break strength of 5000 pounds/ 22.2 KN.
- Have manufacturer and strength rating capacity markings clearly stamped on the connector.

Fall arresting connectors come in many different designs. The nature of the job should be considered when selecting connectors. Connectors that fit over a ladder rung or scaffold rail should be selected when working on scaffolding or ladders.

Some typical examples of connectors are shown in the figure below:

Snap Hooks

Connectors must not be dropped onto a hard surface. Any connector that has suffered an impact on a hard surface from a height of 5 meters or more must be removed from service. Cracks invisible to the naked eye may have been developed making the connector unsafe.

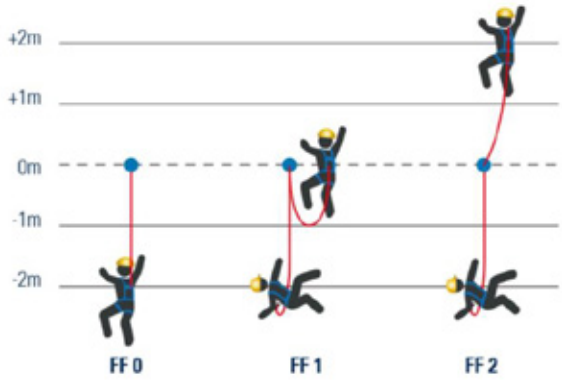
Lanyards

Fall arrest lanyards are made of rope, webbing or wire cable which is then attached to the workers harness and connected to a solid anchorage, and is an integral part of the fall arrest system. A lanyard can provide restraint or tension and therefore allow work positioning. It is prohibited to tie a fall arrest lanyard onto itself as a means of anchoring the lanyard unless the lanyard is specifically designed for such use. Double lanyards shall be used in all cases.

Care must be taken when using a lanyard to prevent it from contacting surfaces that are sharp, corrosive, cold, and hot or in any way capable of damaging the lanyard when it is in use. In case such hazards cannot be avoided a cable lanyard shall be used.

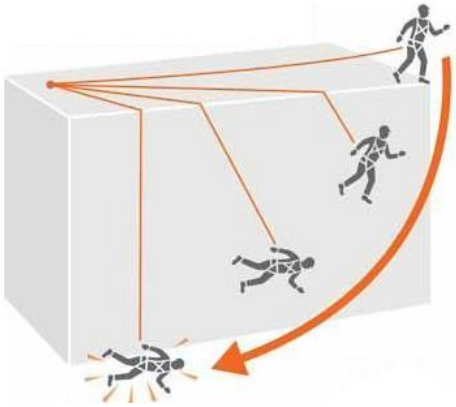
In cases where falls are possible a shock absorber should be incorporated into the fall protection system. Shock absorbers should limit the force of a fall to 3.6 KN (360kg).

- Lanyards should be connected to a suitable anchor (16KN strength if certified or 22KN strength if not certified) and whenever practical, be connected above the user in order to maintain a fall-factor-one (1) ratio. Fall-factor-two (2) ratios are to be avoided.



Fall Factors

- During use of lanyards care must be taken to avoid the following pendulum hazard.



Pendulum Effect

- The following is a typical webbing lanyard with shock absorbers incorporated in the lanyard.

Lanyard with Shock Absorber

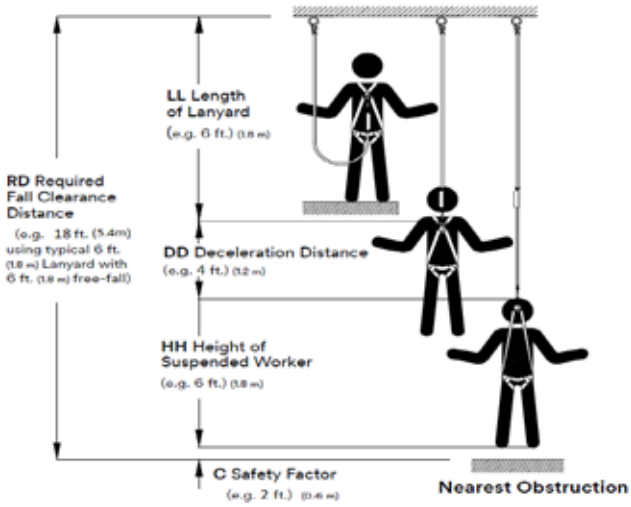
Energy Absorbers

An energy absorber (also known as a shock absorber or load limiter) is designated to limit the force of fall to a safe limit (3.6KN) so the person that falls does not sustain internal injuries in the process of the fall being arrested. An energy absorber shall be integrated into the fall protection system, whenever a fall is possible. Energy absorbers shall always be connected to the fall arrest harness D-ring positioned at the back of the fall arrest harness.

The use of energy absorbers introduces an inherent hazard which is a product of the manner in which the energy absorber absorbs impact forces. When a person falls, the energy absorber extends by way of stitches built into the webbing. This reduces the impact of the forces.

Extreme care must be taken when considering the "fall distance" when rigging fall arrest systems. The following is an example of what needs to be calculated in assessing the adequacy of a fall arrest system.

Additional hazards may exist in the event the fall line is not free from obstructions. Every effort must be taken to reduce the likelihood of striking objects that may be below a worker, should he accidentally fall.



Fall Distance

Anchorage point for fall arresting and restraint systems

Anchorage points may be permanent (certified by an engineer) or temporary (not certified by an engineer).
The following anchorage strengths requirements apply:

- Engineered arresting anchors (permanent) – 16KN strength requirement
- Engineered restraint anchors (permanent) – 3.8KN strength requirement
- Non engineered anchors (temporary) – 22KN strength requirement

A suitably qualified and experienced engineer shall be consulted if there is any doubt about the underlying structure or the anchorage point. Each worker shall have his own anchor point. It is not allowed to attach more than one person to a single anchor point. Permanent anchors shall be clearly identified.

In case of life lines, these shall only be allowed if it is ready made life lines, and are installed by suitably experienced personnel, or if the life line is designed by an engineer.

4.8.4 Care and Maintenance

Equipment must be kept in a cool, dry and well ventilated place. It must not be exposed to direct sunlight during storage. It is advisable to reserve a separate room for storage. Equipment that has been contaminated during use must be cleaned in accordance with the manufacturer's requirements.

Harnesses, lanyards and associated pieces shall be stored in a carry bag designed for this purpose. Each bag shall be labeled with the contents.

4.8.5 Codes and Standards

Relevant standards for fall protection are as follows:

- EN 361 – Fall arrest harnesses
- EN 355 – Energy absorbing devices
- EN 362 – Connectors
- EN 358 – Work positioning harnesses
- EN 353-2 – Guided type fall arrest

4.9 Suitability and Selection of PPE's

4.9.1 General Suitability & Selection Criteria

PPE shall be suitable for the degree of protection which it is required to provide. In particular, PPE shall not be considered suitable unless:

- It is appropriate for the risk(s) involved.
- It is appropriate for the conditions at the place where exposure to risk may occur.
- It takes account of ergonomic requirements.
- It takes account of the state of health of the person wearing it.
- It is capable of fitting the wearer correctly.
- It is effective in controlling the risk(s) involved without increasing the overall risk(s).

Several types of PPE may be suitable for any particular job. The key issues to be considered when selecting appropriate PPE are:

- The type of job and the demands it may place on the worker. Consideration shall be given to all.
- Aspects of the job including the length of time for which the PPE will be worn, the mobility, vision and communication required by the worker, the physical effort required by the job, and the methods of work.
- The level of risks likely to be encountered.
- The parts of the body to be protected.

Personnel who will be required to use PPE shall be consulted prior to final selection of the equipment.

This will provide useful input to the selection process from those who will know best what is involved during the job. The aim shall always be to choose appropriate PPE that will give the correct level of protection with the least discomfort to the user. Other factors may also need to be considered in the selection process such as:

- Disposable versus reusable.
- Maintenance requirements.

- Durability in use.
- Availability of equipment in different sizes.

All PPE shall be of the appropriate standard and shall be certified to an internationally accepted standard, e.g. European Standard (CE mark). If there are any doubts about the suitability of the PPE, advice shall be sought from a suitably qualified and competent person e.g. Safety Engineer and Occupational Health Engineer.

4.9.2 Compatibility of PPE

Where there is more than one risk to health that requires the wearing of PPE, it is important that the PPE selected is compatible and continues to be effective against the risks. For example, where a hard hat and a respirator are simultaneously required, it is important to check that both can be worn correctly and that both continue to give adequate protection from the risks for which they have been selected.

4.9.3 PPE Assessment

In order to ensure that PPE is suitable and effective for the level of protection required, the department manager shall:

- Assess any risks to health that have not been avoided by other means.
- Define the characteristics that PPE shall have in order to be effective against the assessed risks. Risks that the equipment might introduce shall also be taken into account.
- Question whether the available PPE has the characteristics that make it effective against the assessed risks.

PPE never provides one hundred percent (100%) protection, although some PPE provides very high levels of protection. It is necessary to have some indication of the level of risk so that the performance required of the PPE can be assessed. This information may have been gathered by the assessment or may be available through documents published by authoritative safety organizations, e.g. The Health & Safety Executive (HSE) or the American Conference of Governmental Industrial Hygienists (ACGIH).

In simple cases, the assessment to identify suitable PPE need not be recorded. In more complex cases, it shall be recorded and made readily accessible to those who may need to know the results.

4.10 Standard, Maintenance & Storage of PPE

4.10.1 Minimum Standard

Protective clothing shall be issued which is suitable for an individual site. As a minimum worksite personnel are required to wear a safety helmet, safety glasses, coveralls and safety boots.

Personnel, who work inside e.g. in galleys or kitchens, cleaning accommodation, in workshops or maintaining office equipment etc., must also be provided with suitable PPE. Local rules will state the areas in which this equipment is required to be worn. Shorts and other similar sportswear should not be worn at operational sites.

The minimum standards set by the COMPANY for protective clothing or equipment shall apply, as appropriate, to all persons on site, including visitors and contractor's personnel. PPE shall comply with relevant standards as mentioned in this document.

4.10.2 Maintenance of PPE

- PPE must be maintained in an efficient state. The level of inspection or maintenance with respect to PPE will be determined by the type of equipment used and the conditions in which it is used.
- With simple equipment, an inspection by the user immediately before use may suffice, and maintenance may be in the form of cleaning or laundering, with the item being replaced when worn out.
- Protective clothing and equipment should be used properly, and any defects in the equipment shall be reported to the supervisor.
- Do not wear clothing or equipment that is contaminated (e.g. oil, grease or other substances), return it for cleaning or replacement.
- Where appropriate, a record of inspection and maintenance will be necessary, and manufacturer's maintenance schedules should be strictly followed.

4.10.3 Storage of PPE

PPE must be stored correctly. Company shall make appropriate arrangements for the storage of PPE. Storage shall be done as per below instructions:

- The storage shall be adequate to protect the equipment from damage or contamination.
- Items of PPE shall be adequate to protect the equipment from damage or contamination.

4.11 Performance Measures

Compliance with this Procedure shall be monitored regularly and the number of near misses, incidents and accidents associated with PPE shall be recorded and all efforts made to eliminate, prevent and control further occurrence of these. A culture of no blame reporting of near misses and accidents shall be implemented, root causes identified and weaknesses in the system reviewed and revised to eliminate further incidents.

5.0 Training

Those involved in the use of PPE shall be given suitable instruction and training in the use of particular equipment as follows:

- 'Everyday' equipment which is simple to use will require only basic instructions.
- Personnel involvement in the use, maintenance, repairs or testing of more complex equipment will require formal training, and such training may be both theoretical and practical. In such cases, refresher training may be required, as an appropriate, and records of training details should be kept.

6.0 References

- Health & Safety Executive (UK)
- OSHA, 29 CFR 1910-132, Personal Protective Equipment
- OSHA, 29 CFR 1910-134, Respiratory Protection Standard
- OSHA, 29 CFR 1926-500, 1926-501, 1926-502, 1926-503, Fall Protection Standards
- NIOSH Standards (National Institute of Occupational Safety & Health)

7.0 Attached Documents

- Annexure A: Personal Protective Equipment Inspection Checklist

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

MANUAL LIFTING AND HANDLING

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

This procedure establishes the for guidance and awareness for all employees about manual lifting and handling hazards and precautions to be taken when handling various types of materials to avoid any injury related to any task which required the manual handling.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of SABQ Energy Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

Center of Gravity: The center of gravity (C of G) is where all of the weight of an object appears to be concentrated. This point is the average distribution of the weight of the object.

Fatigue: extreme tiredness resulting from mental or physical exertion or illness.

Manual Handling: Any transporting or supporting of a load (including the lifting, putting down, pushing, pulling, carrying or moving thereof) by hand or bodily force.

Musculoskeletal Disorder (MSD): It is an injury, illness, disease or disorders that arises in whole or in part from manual handling tasks, whether suddenly or over a long period of time that affect the human body's movement or musculoskeletal system (i.e. muscles, tendons, ligaments, nerves, discs, blood vessels, etc.). Common MSDs include: Carpal Tunnel Syndrome, Tendonitis, Muscle / Tendon strain.

Work Related Upper Limb Disorders (**WRULDs**): These are impairments of bodily structures such as to a tendon, nerve, muscle, joint, bursa or the localized blood circulation system. Principally, they are caused by the performance of work and by the effects of the immediate environment where that work is carried out.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Shall be responsible to ensure that the hazards associated with manual lifting and handling activities in their area of responsibility (including contractor activities) are managed in accordance with the requirements of this procedure.
- Shall be responsible to reviews and approves procurement requisitions: carries out checks and inspections to ensure that delivered goods are of good quality in respect of health and safety.
- Shall be responsible to ensure that accidents related manual lifting and handling are reported, investigated and that corrective and preventive measures are taken.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Representative

- Shall be responsible to ensure that the correct implementation of the safety precautions enclosed within the procedure.
- Shall be responsible to that necessary training will be conducted for the personnel involved in manual handling (e.g. Toolbox Meeting, Manual handling training).
- Shall be responsible to ensure that Job Safety Analysis (JSA) is applied.
- Shall be responsible for monitoring the safe practices related to manual handling to be applied, educate the personnel about the correct method of manual handling.

3.6 Job Supervisor

- Shall be responsible for all jobs executed under their control involving the manual handling to be carried out as per this procedure to avoid any kind of injury.
- Shall be responsible to ensure that all of his crews attend the HSE training before carry out this activity.

4.0 Procedure

4.1 General Requirements

The following requirements are to be applied to all material handling activities:

- Personnel shall be aware of the proper methods of lifting and moving heavy or awkward load, either manually or with mechanical assistance.
- Suitable protective clothing to avoid pinching or cutting of hands, injury to head or feet, inhalation of dust, etc. shall be worn, as necessary.
- Storage shall be arranged to minimize the amount of handling.
- Storage shall be kept tidy and shall not obstruct roadways, walkways, and work areas escape routes from hazardous areas, fire protection equipment or other emergency devices and equipment.
- Where handling of materials is done in conjunction with cranes and lifting gear, reference shall be made to this procedure.
- Avoid or reduce reaching/bending and reduce effort and force needed to perform work tasks.
- Plan the workflow to eliminate unnecessary lifts.

- Minimize the distances that loads are lifted and lowered.
- For loads that are unstable and/or heavy:
    - Tag the load to alert workers.
    - Test the load for stability and weight before carrying the load.
    - Use mechanical devices or equipment to lift the load.
    - Reduce the weight of the load by putting fewer items in the container or using a smaller and/or lighter-weight container.
    - Repack containers so contents will not shift and the weight is balanced.
    - Use team lifting as a temporary measure for heavy or bulky objects.
- Reduce the frequency of lifting and the amount of time employees perform lifting tasks by:
    - Rotating workers in lifting tasks with other workers in non-lifting tasks.
    - Having workers alternate lifting tasks with non-lifting tasks.

4.2 Principle Risks and Hazards

Typical accidents that may occur from handling materials include:

- Crush injuries from falling loads, collapsing stacks, etc.
- Mechanical damage to storage containers, leaking and spillage of chemicals with the risk of toxic contamination or fire.
- Cuts, falls, back injuries, pulled muscles, etc. from poor lifting methods or careless storage.
- Damage to the musculoskeletal system of the body (muscles, tendons, ligaments, bones, joints, bursa, blood vessels and nerves) as a consequence of gradual and cumulative wear and tear through repetitive manual handling. These injuries are called 'musculoskeletal disorders' (MSDs) and can be divided into 3 groups:
    - Neck and upper limb disorders.
    - Lower limb disorders.
    - Back pain and back injuries.

4.2.1 What makes manual handling hazardous?

There are several factors that make manual handling hazardous, and increase the risk of injury. These are called risk factors. The risk factors, particularly for back injury, are related to 4 aspects of manual handling: the load, the task, the environment and the individual.

The Load

The risk of back injury increases during lifting, carrying, pushing and pulling of loads, if the load is:

- Too heavy:

There is no exact weight limit for manual handling. A weight of 20 to 25 kg is heavy to lift for most people, especially if the load is handled several times in an hour. Note that pushing or pulling often imposes less loading on the body than lifting or carrying.

- Too large:
  One basic rule for lifting and carrying is to keep the load as close to the body as possible. In order to get a broad load close to the body, the worker has to open the arms to reach and hold the load. The arm muscles cannot produce force when reaching as effectively as with the arms held in close. Thus, the muscles will get tired more rapidly when handling a large bulky load.

- Difficult to grasp :
  Loads that are difficult to grasp can result in the object slipping, causing sudden movement of the load. Providing the objects with handles or using aids for gripping (e.g. when carrying plate material) reduces the load on the worker. Loads with sharp edges or of dangerous materials (solids or liquids) can injure workers, especially in the event of a collision.

- Unbalanced, unstable:
  With unbalanced objects, it is difficult to hold the center of gravity of the load close to the middle of the body. This leads to uneven loading of muscles, and fatigue. Unstable or moving content, such as a liquid, causes uneven loading of the muscles and sudden movements of the load can make workers lose their balance and fall.

- Difficult to reach:
  Loads that can only be reached with outstretched arms, or by bending or twisting the trunk, require more muscular force. The spine may easily be hurt if the trunk is bent or twisted while lifting.

The Task

The risk of back injury increases if the task:

- Is too strenuous:
  Tasks may be very demanding if they have to be carried out too frequently or for too long with insufficient rest or recovery time (e.g. continuous lifting or carrying for long distances, or activities where the working speed is imposed by a process which cannot be altered by the worker).

- Involves awkward postures or movements:
  Working with a bent and/or twisted trunk, raised arms, bent wrists, a bent neck and turned head increases the risk of back injury and should be avoided, as should twisting, turning and bending movements of the trunk, overreaching, sudden movements and repetitive handling.

The Environment

The following characteristics of the work environment may increase the risk of back injury:

- Space available:
  A lack of space to carry out manual handling may lead to inappropriate body postures and dangerous imbalance in the loads.

- Floor:
  Handling loads on different working levels or on floors that are slippery, uneven or unstable (such as working platforms or fishing boats) may increase the risk of accidents and back injury.

- Climate:
  The physical climate (temperature, humidity and ventilation) may affect the risk of back injury. Heat creates a feeling tiredness, and sweat makes it hard to hold tools, requiring more force. Cold can make hands numb, making it hard to grip.

- Lighting:
  Insufficient lighting may increase the risk of accidents when handling loads. It may also make you work in awkward positions to see clearly what you are doing

The Individual

There are also some individual factors that can influence the risk of back injury:

- Experience, training and familiarity with the job (for example, new episodes of low back pain are common in the first year of employment)
- Age (the risk of low back disorders increases with the number of years at work: the first episode of low back pain occurs in most people by the age of 30).
- Physical dimensions and capacity (length, weight, strength, etc.).
- Personal lifestyle (smoking may, for example, increase the risk of low back disorders).
- History of back disorders (this is a predictor of future back injuries).
- Willingness to use personal protective equipment (for example, clothing and footwear).

4.3 Manual Handling

Care should be taken when lifting or moving a load and the following guidelines should be followed:

- Visually check route prior to lifting and carrying.
- If a trolley is available - use it.
- Seek assistance when lifting heavy loads.
- Be sure that the load is within your lifting capabilities and ensure that the Centre of Gravity (C of G) of the load is nearest to you.
- Always lift using the leg and not with your back.
- Never twist your body when carrying a heavy load.

Body posture is very important when lifting. Correct positioning will reduce the risk of back and muscle injuries during lifting.

Stance: Face the direction of travel, stand over the weight. Feet slightly apart and one in front of the other. This position enables you to keep your balance.

Back: Keeping a reasonably straight back lets the powerful leg muscles do the work, and also protects the spinal column.

Chin: Before lifting, raise the head slightly and tuck the chin in. This helps to keep the back in an upright posture.

Grip: Take a proper hold. Grip with the palms of the hand and the roots of the fingers. Never lift using only the finger tips.

Arms: Keep arms as close to the body as possible. The body itself then takes some of the weight instead of just the arms and hands.

Feet: The feet should be apart the width of the hips and the leading foot should always point in the direction you intend to move off in.

Body: Use your body as a counterweight to save energy and muscular effort.

Safe Manual Lifting

4.4 Handling Precautions

Inspection to observe manual handling activity can be done on **Annexure A: Manual Handling Checklist.**

4.4.1 Drums

Drums contain various liquids and powders and are often of a size which makes them awkward to handle. The following precautions shall be observed:

- Drums shall never be handled manually up or down stairways, elevated areas or into excavations.
- Mechanical handling aids (e.g. drum trolleys) shall be used, where appropriate.
- In open storage areas, drums shall be stored lying down to prevent water collecting in the top rim, but these must be secured against movement (e.g. chocks or racks).
- When located in areas other than in a designated storage area, drums shall be left in a position so as not to cause an obstruction.
- Where drums are located for dispensing their contents, drip trays shall be provided to prevent liquids causing a slipping hazard to personnel walking past, or a fire hazard from flammable liquids.

All empty drums shall be removed from working areas.

4.4.2 Pipe Storage

Pipes and casings are particularly heavy items, and even when moving slowly present a risk of serious crushing incidents because of the high amount of weight inertia involved. Handling and storage of such heavy items must be conducted in accordance with this procedure.

Pipes shall be stacked in horizontal layers, supported, if necessary, with suitable packing materials between them. The following precautions apply to pipe storage:

- Pipes shall slope towards the back of a storage area so that they cannot roll off the support rack.
- Pipes shall never protrude into roadways, walkways and escape routes, or be stacked so they can fall through guardrails in the event of displacement.
- Pipe storage areas shall never be overloaded.

4.4.3 Metal Sheets

Falling of metal sheets and plates can cause particularly severe crushing or guillotine injuries. The following precautions shall be taken:

- Personnel handling sheet metal shall always wear suitable protective gloves (e.g. chrome leather with armored palms).
- Where possible, metal sheets shall be handled mechanically.

- Vertical stacking of small sheets can save valuable floor space and prevent obstructions, but precautions shall be taken to prevent them slipping or falling over (e.g. Kevlar Gloves).
- Where sheets are stored horizontally, larger sheets shall be placed at the bottom and spacing blocks should be placed between the sheets to ensure easier handling, battens shall be used where necessary.

4.4.4 Pallets

Incorrect use of pallets can lead to unsafe lifting operations or to collapse of material stacks. Precautions to be observed are:

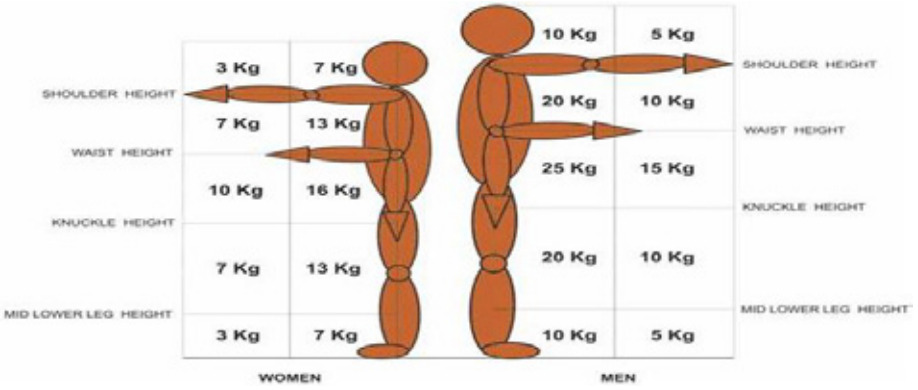
- Pallets shall only be used for the purpose they were intended, bearing in mind their construction, and correctly loaded.
- Pallets shall not be used if damaged.
- Pallets shall be kept in designated areas, with precautions taken to prevent collapse or tilting.
- Pallet stacks shall not exceed 4 pallet loads.

4.5 Maximum Manual Load Handling

SABQ has not set specific standard which sets limits on how much a person may lift or carry. However a general load limit is shown in the figure below but these limits may vary depending on the following factors:

- How often workers are lifting something.
- How high an object is lifted?
- Where the origin of the lift occurs; specifically, whether it is below knuckle height.
- Whether worker hold the object away from body while lifting.
- How long worker lift or hold the object.

Depending on these factors, an object that is safe to lift at one time can cause back problems another time. Therefore, risk associated with manual handling shall be assessed by the worker, supervisor or HSE professional at site prior to the lift.



General Load Limits

5.0 Training

Personnel allocated to tasks involving manual lifting and handling of material shall be given instruction in the safe method of manual lifting and handling. Training will also include instruction in the handling of specific products that are accompanied by a material safety data sheet. Personnel will not be permitted to handle any hazardous products without first being briefed on the safe handling procedures and instructed in the use of appropriate personal protective equipment.

General training shall be given to all workers that should at least cove:

- manual handling risk factors and how injuries can occur;
- how to carry out safe manual handling, including good handling technique;
- appropriate systems of work for the individual's tasks and environment;
- use of mechanical aids;
- practical work to allow the trainer to identify and put right anything the trainee is not doing safely.

6.0 References

- Health & Safety Executive (UK)
- Occupational Safety and Health Administration (OSHA), 1910: 176 Handling Materials
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ADNOC – HSE Management System Guidelines

7.0 Attachments

- Annexure A: Manual Handling Checklist

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

WORKING AT HEIGHT (FALL PROTECTION)

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

This procedure establishes minimum requirements and guidelines to provide maximum prevention and protection against falls from elevated areas. This HSE Procedure will apply to all activities carried out at height activities at SABQ project sites and workshop.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of SABQ Energy Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

Anchorage: Solid place, structure or secure point suitable for anchoring or securing a load usually a person working a height.

Elevation: The action of raising or being raised to a higher level, position or height above a given level.

Fall Arrest System: Fall arrest is the form of fall protection which involves the safe stopping of a person already falling. It is one option of protection that OSHA requires for workers on sites who are exposed to vertical drops of 6 feet or more. It includes body harness, vertical lifeline/lanyard, webbing etc.

Full Body Harness: It is a body holding device used to protect workers from falls by distributing the force of the fall over a large area of the body, ensuring that the subject of the fall remains suspended in an upright position after the fall has occurred.

Guardrail: Guardrail system means a barrier erected along an unprotected or exposed side, edge, or other area of a walking or working surface to prevent employees from falling to a lower level.

Handrail: It means a rail used to provide workers with a handhold or grip for support while working on an elevated platform.

Lanyard: A strap, rope or cord attached with the body harness used to secure or raise and lower the body safely while working on an elevated platform.

Platform: A working platform can be virtually any surface from which work can be carried out, such as: a roof, a floor, a platform on a scaffold, mobile elevating work platforms.

Prefabricated Modular Unit: Theses are structures that consist of repeated sections called modules. "Modular" is a construction method that involves constructing sections away from the building site, then delivering them to the intended site.

Ramp: A sloping way or plane: such as a sloping floor, walk, or roadway leading from one level to another.

Retractable Device: OSHA defines a “retractable” as a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Snap hook: A hook with a spring allowing the entrance but preventing the escape of a cord, link.

Stanchion: In event management a stanchion is an upright bar or post that includes retractable belts, velvet ropes, or plastic chains, sometimes in conjunction with wall-mounted barrier devices, barricades, and printed signage, and often used for crowd control and engineering people flow and construction site safety.

100% Tie Off: It means to use full body harness with double lanyard that are always tied with the anchoring point to provide fall protection from a height.

Work at Height: Work at height means work in any place where, if there were no precautions in place, a person could fall a distance liable to cause personal injury (for example a fall through a fragile roof).

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Reviews and approves procurement requisitions: carries out checks and inspections to ensure that delivered goods used for working at height / fall prevention & protection activities are of good quality in respect of health and safety.
- Shall be responsible to provide the required fall protection equipment for the personnel involved in working at height jobs.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Lead

- Shall be responsible to ensure that all personnel wear the required fall protection before they deployed to the jobs at height.
- Shall be responsible to scheme and perform the HSE training for the personnel.
- Shall be responsible to ensure that the inspection schedule of all fall protection equipment and procedure is being followed.
- Shall be responsible to measure compliance of this procedure through audits and inspections.
- Shall be responsible to initiate action against violation of this procedure.

3.6 Job Supervisor

- Shall be responsible to ensure that workers have received proper training on fall hazard recognition, fall prevention measures, and the use of fall protection equipment.
- Shall be responsible to ensure visual and documented inspections of fall protection equipment.
- Shall be responsible to assure that provisions for prompt rescue of fallen employees are planned.
- Shall be responsible to assure that fall protection equipment is used in compliance with this work instruction including manufacturer and regulatory requirements.

4.0 Procedure

When employees work from an unprotected elevation of six feet (1.8 meters) above or lower level, fall protection equipment shall be used. Working means while traveling, stationary, or at any time exposed to a fall from a surface not protected by approved handrails, guardrails, or some other approved fall arrest or restraint device. The potential fall hazard distance is measured from the employee's feet to the walking and working surface below.

A person is working height if:

- Work above ground/floor level (1.8 meters).
- Could fall from an edge, through an opening or fragile surface.
- Could fall from ground level into an opening in a floor or a hole in the ground.

Working at height does not include a slip or a trip on the level, as a fall from height has to involve a fall from one level to a lower level, nor does it include walking up and down a permanent staircase in a building.

Inspection for work at height shall be carried out prior to the job in order to make sure that the work carried out is secured and all safety protocols of work at height are being followed. This inspection shall be recorded on **HSE-FRM-032: Work at Height Checklist**.

4.1 Hierarchy of Fall Hazard Control

Fall prevention planning should begin during the design phase whenever possible. Even when the design phase is complete, many engineering controls are still feasible. Fall hazard control measures should be initiated in the following order.

4.1.1 Fall Elimination

Eliminate work at elevation by:

- Performing work on the ground.
- Attaching guardrail protection to forms and work platforms while on the ground.
- Attaching fall arrest systems to formwork or other structural components before erection.
- Using ground release devices to disconnect rigging from the ground.
- Maximizing the pre-assembly of formwork, structural steel, and other components.

4.1.2 Design Safety & Engineering Controls

Design-out or Engineer-out" fall hazards:

- Review shop drawings and interface with fabricators and material suppliers to design safety features into the structure, material, or equipment to be used.
- Maximize use of prefabricated modular units.
- Add stairways and platforms that can be used for access both during construction and maintenance operations.
- Design attachment points for guardrail systems, stanchions, or self-retracting lifelines that can be attached on the ground and provide protection for the first person to access the elevation.

4.1.3 Fall Prevention

Prevent falls from elevation by using:

- Guardrail systems
- Scaffolds
- Aerial lifts
- Skylight/scuttle guarding
- Fall restraint
- Hole/Floor covers

4.1.4 Fall Protection

Protect employees when they fall by the use of fall arrest systems.

- Fall protection system/equipment used to arrest falling employees are the least desirable method of protection because:
  - They only minimize the consequences of a fall rather than prevent its occurrence.
  - They rely on human behavior to prevent injury.
- The use of fall protection equipment, such as harnesses, lanyards, anchorage, retractable devices, etc. must be planned in the work activity and used properly to reduce the risk of injury from falling.

4.2 Fall Hazard Control

Personnel shall be prevented from falling or protected by a fall arrest system whenever working six feet (1.8 meters) or more above a lower level. This requirement applies to unprotected sides/edges, leading edges, hoist areas, holes, and floor openings, formwork, and reinforcing steel, excavations, roofing work, pre-cast concrete erection, and other walking/working surfaces not otherwise addressed.

4.2.1 Methods of Fall Prevention & Protection

- Fall hazard control shall be provided in the form of fall prevention systems, which includes guardrail systems, scaffolds, aerial lifts, barricades, and hole covers.
- Fall protection measures include the use of personal fall arrest systems or similar means of fall protection. Emphasis should also be placed on providing protection from falling objects and from slips and trips on the same level.

4.2.2 Planning

Prior to each phase of work, site supervision is responsible for planning fall prevention and fall protection measures to protect employees from fall exposures. The planning effort includes:

- Identifying potential fall hazards.
- Using design safety to eliminate or engineer out fall exposure.
- Determining the appropriate method of protection.
- Supplying anchorage.
- Providing education, training, and enforcement.
- Arranging for rescue and rescue equipment.

4.3 Fall Prevention Methods

Fall prevention is preferred over the use of fall protection devices. Fall prevention methods are described below.

4.3.1 Proper Access

Providing safe access to and from work locations is the first step in preventing falls. This includes planning safe access/egress routes of travel and proper installation and use of:

- Ladders,
- Scaffolds,
- Stair Towers,
- Stairways,
- Ramps,
- Backfilling around footers, slabs, and other structures.

4.3.2 Guardrail Protection

Work locations requiring guardrail protection include:

- Elevated work platforms such as formwork,
- Scaffolds,
- Openings/holes in decks, floors, roofs, and slabs,
- Unprotected sides of ramps, stairs, platforms, roofs,
- Leading edges,
- Elevator shaft openings,
- Ladder way, skylight, manhole, and trap door openings.

4.4 Fall Prevention System Requirements

4.4.1 Guardrail Systems

- Guardrail systems shall be so surfaced to prevent injury from punctures or lacerations and to prevent snagging of clothes.
- The ends of top rails and mid-rails shall not overhang the terminal posts, except where such projection does not constitute a projection hazard.
- Guardrail systems used around holes and horizontal wall openings shall be erected on all unprotected sides and edges of holes.
- Guardrail systems used on ramps and runways shall be erected along each unprotected side or edge. Guardrail systems shall be used around holes, which are points of access, such as ladder ways. Every ladder way floor opening or platform shall be guarded by a standard guardrail system including toe boards on all exposed sides, except at the entrance to the opening. The passage through the railing shall either be provided with a swing gate or barrier or offset such that a person cannot walk directly into the opening.
- Guardrail installation should occur as work progresses. Figure one shows its dimensions.
- Plan inspections for damage and proper construction and immediately replace damaged guardrails.

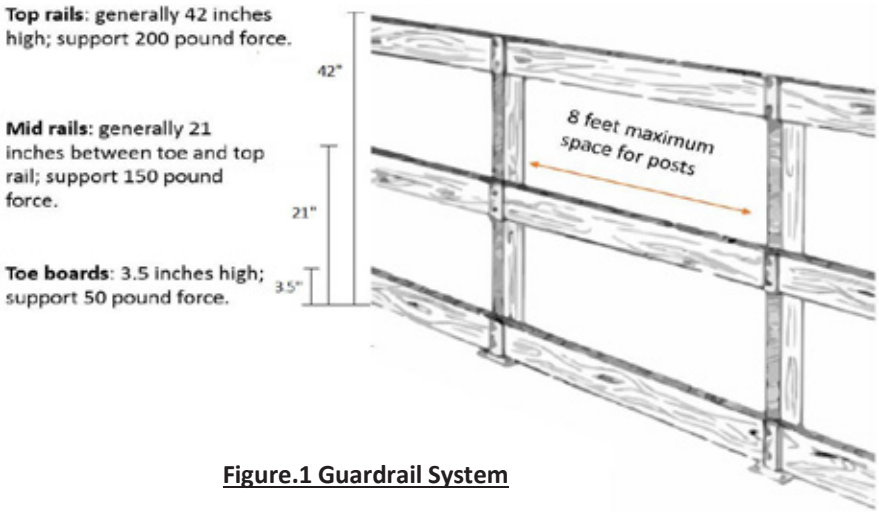


Figure.1 Guardrail System

4.4.2 Top Rails

- Top-rail height must be 42 inches plus or minus 3 inches above the walking and/or working surface.
- Guardrail systems shall be capable of withstanding, without failure a force of 200 pounds applied within 2 inches of the top edge in any direction.
- When the 200 pounds is applied in a downward direction to the top edge of the guardrail, it shall not deflect to a height less than 39 inches above the walking or working level.

4.4.3 Mid Rails

- Mid-rails, screens, mesh, intermediate vertical members or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working and when there is no wall or parapet wall at least 21 inches high.
- Mid-rails when used shall be installed at a location midway between the top edge of the guardrail system and the walking or working level.
- Screens and mesh when used shall extend from the top-rail to the walking/working level and along the complete opening between top-rail supports.
- Mid-rails, screens, mesh intermediate vertical members or equivalent structural members shall be able to withstand a force of at least 150 pounds applied in any direction.
- Intermediate vertical members when used between posts shall not be more than 19 inches apart.

4.4.4 Toe boards

Falling object protection is provided by toe boards, or screens on guardrail systems. Toe boards shall be:

- Erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.
- Capable of withstanding, without failure, a force of 50 pounds applied in any direction.
- A minimum of 3½ inches in vertical height.
- No more than ¼ inch above the walking and/or working surface.
- Solid or have openings not more than 1 inch in greatest dimension.
- Where tools, material, equipment are piled higher than the top edge of a toeboards, paneling or screening shall be erected from the walking/working surface to the top of the guardrail systems top or mid-rail for a distance sufficient to protect employees below.

4.4.5 Covers for Opening & Holes

- All covers, including those covers located in roadways, shall be capable of supporting at least twice the weight of employees, equipment, and material that may be imposed on the cover at any one time.
- Covers shall be secured to prevent accidental displacement by cleating the underside, tying the cover to grating, or other means to prevent accidental displacement.
- Covers shall be color coded, or marked with the word “hole” or “cover”.
- Identify openings and holes. Holes are defined as a gap or void 2 inches or more in at least one dimension in a floor, roof, or walking, and working surface.
- Install protection as soon as an opening is created.
- Immediately replace covers, which have been removed or damaged.

- Perform regular inspection and proper maintenance.
- Use fall arrest equipment when working near unprotected openings.

4.4.6 Elevated Equipment

Employees are required to be tied-off 100% of the time when operating:

- Aerial lifts and scissor lifts.
- Crane suspended personnel work platforms. Use of this equipment is limited and governed by applicable regulations and should only be used as a last resort. Use of a crane suspended personnel work platform requires prior authorization by the Client, Facility Manager, Project Manager (or designee).

4.4.7 100% Tie Off

Appropriate tie-off means must be planned and provided for where no positive protection is provided. This planning is addressed in the construction hazard analysis and pre-planning meetings and progress meetings. An evaluation like JSA or Risk Assessment shall be conducted for each work area to identify those not adequately protected and employees shall not ascend to such areas unless appropriate fall protection equipment and tie-off means are made available.

4.4.8 Housekeeping

- Keep walking and working areas free of debris, material, and equipment.
- Enforce daily cleanup of work areas.
- Provide a sufficient number of trash containers for clean-up.

4.5 Fall Protection & Fall Arrest Systems

- The primary function of a fall arrest system is to minimize the consequences of a fall rather than prevent its occurrence. Fall arrest systems provide complete and continuous fall protection while accessing and working at elevation.
- A complete fall arrest system includes the proper anchorage, body support (harness), and connecting device (lanyards/lifelines) interconnected and properly rigged to arrest a free fall.
- Fall arrest systems must be installed and used in accordance with the manufacturer's recommendations and under the supervision of a Qualified Person.

4.6 Fall Protection Equipment Requirements

4.6.1 General Requirements

- Any equipment that is used as part of a fall protection system must be specifically designed for use as part of a fall protection system and must be used according to the manufacturer's recommendations.
- In hot-work operations or those involving chemicals or other factors that could cause damage, fall protection equipment must be designed and/or protected to avoid burning or deterioration.
- All components of personal protection, i.e., harnesses, lanyards, anchorage, lifelines, and connectors must meet the manufacturer and local regulatory requirements.

4.6.2 Anchorage

Anchorage planning is the key to designing fall arrest systems. Anchorage requirements include:

- Strength – capable of supporting 5,000 pounds per employee or twice the anticipated force and designed by a Qualified Person.
- Independence – anchorages must be independent of the work platform, guardrail system, or surfaces/structures supporting employees.
- Location – anchorages should be located overhead to minimize free fall distance. Minimum height policy for most lanyard anchorage is shoulder level, and overhead anchorage locations for both retractable devices and rope grab lifelines. When anchorage is below shoulder level, a Qualified Person shall determine what changes if any need to be made to the fall arrest system such as shorter lanyards, additional shock absorbing capability, etc.
- Sufficient fall clearance – calculate the total fall distance to ensure anchorage height is sufficient to prevent collision with the ground. Also, ensure lateral movement from fixed anchorage does not create a swing fall hazard.
- Identification – anchorage points should be pre-planned and clearly identified to employees.

4.6.3 Full Body Harness

- Full-body harnesses must also be worn and properly anchored when employees are working from aerial lifts, scissor lifts, suspended work platforms, suspended scaffolds, and similar equipment.
- Full-body harnesses must fit and be worn properly with the straps tucked so as not to be caught on equipment or otherwise cause a hazard. Chest straps must be worn between the chest and collarbone and the rear D-ring being worn between the shoulder blades.
- Body belts are not allowed for fall arrest.

Figure 2: Body Harness

4.6.4 Snap Hooks

- Only self-closing, self-locking snaphooks are allowed for fall protection use.
- Snaphooks must open and close properly and be fully closed around their anchorage point.
- Locking mechanisms shall be functionally checked before each use.

Figure 3: Snap Hooks

4.6.5 Shock Absorbers

- This is a required component of an overall fall protection system.
- Minimize loads experienced by anchorage and personnel.

Figure 4: Shock Absorber

4.6.6 Lanyards

- Always use the shortest possible lanyard length.
- Lanyards shall be anchored at a location to limit the free fall distance to no more than six feet.
- Lanyards must be used with a shock absorber unless the fall distance is shortened enough to limit the fall force to 1,800 pounds.
- Lanyards must be maintained free of knots.
- No more than one employee may be attached to the same lanyard.
- Dual or "Y" lanyards may be required to achieve 100% fall protection in some work situations.
- When not in use, the lanyard must be secured in a fashion as to not cause a tripping hazard or become entangled in equipment.
- Flexible steel cable lanyards shall not be used by personnel performing work on or in close proximity to electrical equipment. A non-conductive lanyard must be used.

4.6.7 Retractable Devices and Self-Retracting Lifelines

- Retractable devices are designed to arrest a fall within 2 feet.
- Locking mechanism must be tested before each use.
- Lifeline must be pulled out and inspected for cuts, fraying, or other signs of damage.
- Use taglines to make the device accessible from the ground.
- Taglines must be used to prevent the uncontrolled retraction of these devices.
- Retractable devices should only be attached to overhead anchorage.
- Retractable devices attached to fixed anchorage must be used with the wearer at less than a 45-degree angle from the device to reduce the hazards of a swing fall.
- Only retractable devices bearing current manufacturer's certification shall be used.

4.6.8 Fall Distance

- A fall p all.
- The fal that the user cannot contac culating a clearance distan

  - Fr
  - Sy .
  - Deceleration distance of shock absorbers
  - Employee height
  - Deflection in horizontal life line (HLL) system
  - A minimum safety factor of 2 feet

The safe fall distance and its measurement can be seen in figure. 1

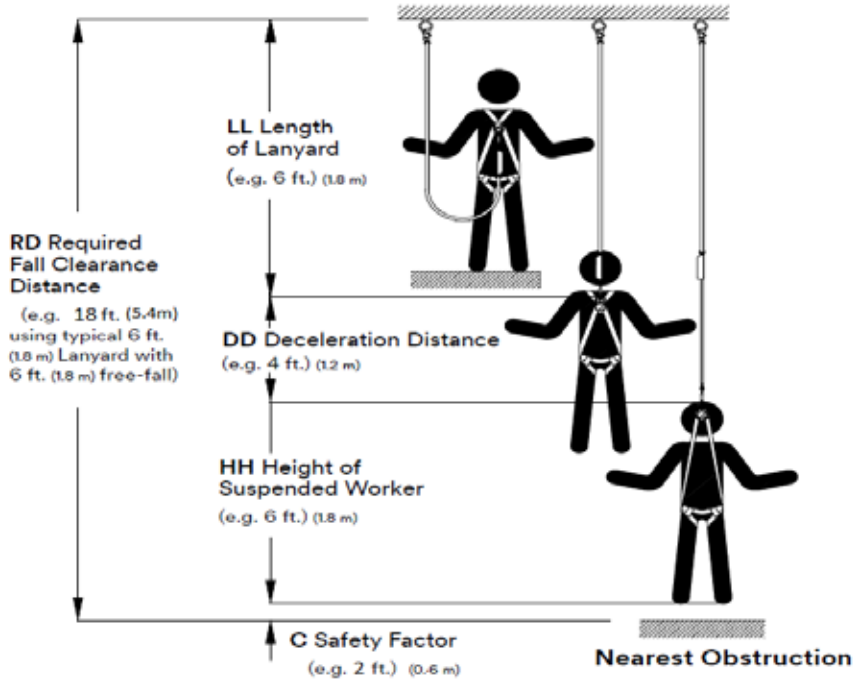


Figure 6: Fall Distance

4.7 Equipment Storage

- Fall protection equipment must be stored in a clean dry location away from exposure to abrasive materials, cutting tools, equipment or materials, excessive heat, direct sunlight, and chemicals.
- Full-body harnesses should be hung by the D-ring for storage.

4.8 Equipment Inspection

- Fall protection equipment must be inspected by the user prior to each use.
- The relevant Site Manager shall ensure a program is in place for inspection of jobsite fall protection equipment by a competent person. Inspections must be conducted at least quarterly, although monthly inspections are preferable. Inspection results must be documented.
- Some types of fall protection equipment, such as self-retracting lifelines, require periodic re-certification by the manufacturer at scheduled intervals. The Competent Person must

be familiar with these requirements and have a documented re-certification performed, as required.

- The Competent Person shall utilize the specific fall protection equipment manufacturer's inspection instructions and the following information to perform inspections.
- Inspection of Harnesses, Lanyards, and Lifelines – Inspections shall evaluate:

  - Harnesses - Lanyards and Lifelines
  - Stitching - Frayed/Broken Strands
  - Rivets - Burns
  - Buckles - Cuts
  - Buckle Tabs - Tears
  - "D" Rings - Snap Hooks
  - Rust and Abrasion - Connectors
  - Burns, Cuts, Tears - Corrosion

- Inspection Markings

  - Fall protection equipment, which has been satisfactorily inspected, shall be marked and/or color-coded with vinyl tape or some other secure means to designate current inspection.
  - Care should be used not to cover any equipment feature/component vital to inspection or performance, such as stitching, grommets, adjusting mechanisms, labels, etc., with the tape or marking means.

4.9 Rescue

- The responsible supervisor must ensure that personnel can be promptly rescued or self-rescue themselves, should a fall occur.
- The availability of rescue personnel, aerial lifts, ladders, other rescue equipment or rescue services and response time should be evaluated prior to elevated work taking place.
- Workers should not be allowed to work alone in situations where personal fall protection is required.
- When the use of fall arrest systems is required on a project, plans shall be made as to how persons may be retrieved in case of a fall arrested by a safety harness and adequate equipment provided on site.
- Names and contact numbers of Emergency Response Team members.
- Availability of qualified first aider and firefighters.
- A backup system of communication.

5.0 Training

Fall arrest system training must include the proper use, care, and limitations of fall protection equipment prior to being allowed to use the equipment. A Competent Person must be designated to provide instruction.

Training must, at a minimum, address the following areas:

- Fall Prevention and Protection (Working at Height) Procedure.
- How to evaluate fall hazards.
- Fall prevention measures.
- Equipment use, care, and limitations F. Proper fitting and wearing of fall protection equipment.
- Requirements and proper use of anchor points.
- Inspection.

Retraining is required when previous training is rendered obsolete due to:

- Changes in the activity/workplace.
- Changes in the fall protection equipment/system.
- A demonstrated improper use or misunderstanding of fall protection systems.

6.0 References

- ISO 45001:2018 OHS
- OSHA 29 CFR, 1926.451 General Requirements – Working at Height
- OSHA 29 CFR, 1926.501 Fall Protection
- OSHA 29 CFR, 1926.502 Fall Protection Systems Criteria & Practices
- OSHA 29 CFR, 1926.503 Training Requirements
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ADNOC – HSE Management System Guidelines

7.0 Attached Documents

- HSE-FRM-032: Work at Height Checklist

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

CONFINED SPACE SYSTEM OF WORK

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

This procedure describes the guidelines to ensure all work associated with entry into confined spaces is carried out in a safe and efficient manner and provides necessary safeguards for personnel engaged to carry out such works at the worksite.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of SABQ Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

Atmosphere: Refers to the gases, vapors, mists, fumes and dusts within a confined space.

Attendant / Hole Watch / SBM: A person trained in emergency rescue procedures and assigned to remain on the outside of the confined space in constant communication with those working inside the confined space. The attendant shall be approved by the qualified HSE trainer.

Ceiling Level: This is the highest airborne concentration of a toxic substance to which an unprotected worker should ever be exposed, even for a very short time.

Combustible Dust: A dust capable of undergoing combustion or burning when subjected to a source of ignition.

Confined Space: Refers to a space which by design has limited access, unfavorable natural ventilation resulting in potential dangerous concentrations of air contaminants and which is not intended for continuous human occupancy e.g. pits, vessels, silos, tanks etc.

CPR: Cardiopulmonary Resuscitation (**CPR**) is an emergency treatment to a person suffering from cardiac arrest or chocking of blood. CPR consists of mouth-to-mouth respiration and chest compression. **CPR** allows oxygenated blood to circulate to vital organs such as the brain and heart.

Entrant: Entrant means an employee who is authorized by the entry supervisor to enter a permit space to do specific job.

Exposure: Any condition which provides an opportunity for an external environmental agent to enter the body.

Hot Work: Any work involving riveting, welding, flame cutting or other fire, spark-producing or similar high temperature producing operations as well as work which produces a source of ignition, such as drilling, abrasive blasting and space heating/drying.

IMS: An Integrated Management System (IMS) integrates all of an organization's systems and processes in to one complete framework, enabling an organization to work as a single unit with unified objectives.

Inert Atmosphere: The atmosphere in a confined space by a non-reactive gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

Intrinsically Safe: It is a design technique applied to electrical equipment and wiring for hazardous locations. The technique is based on limiting energy, electrical and thermal, to a level below that required to ignite a specific hazardous atmospheric mixture.

Isolation: A process whereby the confined space is removed from service and completely protected against the inadvertent release of material by the following means: blanking of supply lines, misaligning sections of all lines and pipes, a double block and bleed system, electrical lockout of all sources of power, and blocking or disconnecting all mechanical linkages.

Lower Flammable Limit (LFL): The minimum concentration of a combustible gas, vapor or dust in air (expressed in percent volume), which will ignite if an ignition source is present.

MSDS: A Material Safety Data Sheet (**MSDS**) is a document that contains information on the potential health effects of exposure to chemicals, or other potentially dangerous substances, and on safe working procedures when handling chemical products.

NORM: Naturally Occurring Radioactive Materials (**NORM**) consist of materials, usually industrial wastes or by-products enriched with radioactive elements found in the environment, such as uranium, thorium and potassium and any of their decay.

Oxygen Deficiency: Refers to an atmosphere with a partial pressure of Oxygen (PO2) less than 132 mm mercury (Hg). Normal air at sea level contains approximately 21% Oxygen at a PO2 of 132mm Hg. For the purposes of this program, an atmosphere containing less than 19.5% Oxygen by volume shall be considered oxygen deficient.

Oxygen Enriched Atmosphere: Any oxygen concentration greater than 23.5% at normal atmospheric pressure.

Permissible Exposure Limit (PEL): The maximum 8-hour time weighted average (TWA) concentration of an airborne contaminant to which an employee may be exposed by law as listed in the Occupational Safety and Health Act, 29 CFR 1910 Sub Part Z.

Purging: The method(s) by which gases, vapors or other airborne impurities are displaced from a confined space. The method usually involves injecting fresh air into the confined space using a compressor or blower, thereby forcing contaminated air out.

Residue: Any waste produced from the process or during the job which is left behind after the primary job. It can be airborne contamination, hazardous liquid or solid waste.

SCBA: A self-contained breathing apparatus (**SCBA**) or simply breathing apparatus (BA), is a device worn by rescue workers, firefighters, and others to provide breathable air in an immediately dangerous to life or health atmosphere.

Sludge: It is thick, soft, wet mud or a similar viscous mixture of liquid and solid components removed from liquid sewage.

Threshold Limit Value (TLV): The maximum 8-hour time weighted average (TWA) concentration of an airborne contaminant to which an employee may be exposed.

TWA: A **time-weighted average** is a workers daily exposure to a hazardous substance (such as chemicals, dusts, fumes, mists, gases, or vapors) or agent (such as occupational noise), averaged to an 8-hour workday, taking into account the **average** levels of the substance or agent and the **time** spent in the area.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Reviews and approves procurement requisitions: carries out checks and inspections to ensure that delivered goods used for confined space are of good quality in respect of health and safety.
- Shall be responsible to ensure that accidents are reported, investigated and that corrective and preventive measures are taken: joins the accident investigation team.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Senior Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.
- Shall be responsible to ensure that hiring and placement plans will not result in dilution of experience for critical HSE activities and functions.

3.5 Site HSE Representative

- Shall be responsible to coordinate with the site manager to ensure that suitable arrangements, including subcontractors, are in place to conduct the confined space work safely.
- Shall be responsible for performing internal audits, advising employees on subjects concerning health and safety.
- Shall be responsible to ensure that necessary work permits and check lists are in place and duly completed before entering.
- Shall be responsible to ensure that the gas test is completed and the atmosphere inside the confined space is safe to enter and perform the activity, and the necessary records are in place.
- Shall be responsible to ensure that the crews working inside are adequately trained with the danger of confined space, and to meet the emergencies.

3.6 Job Supervisor

- Shall be responsible to know the hazards that may be faced during entry, including information on the mode, signs, or symptoms, and consequences of the exposure.
- Shall be responsible to verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Shall be responsible to terminate the entry and cancel the permit when either the entry operations covered by the entry permit have been completed or a condition that is not allowed under the entry permit arises in or near the confined space.
- Shall be responsible to verify that rescue services are available and that the means for summoning them are operable.
- Shall be responsible to prevent unauthorized individuals to enter or attempt to enter the confined space during entry operations.

- Shall be responsible to determine, whenever responsibility for a confined space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.
- Shall be responsible to ensure requirements of confined space referred in **"Annexure A: Job Supervisor Checklist for Confined Space"**.

3.7 Confined Space Attendant / Hole Watcher

- All Attendant Hole watch shall be adequately qualified via SABQ Hole watch training and follow up supervisor directed training on the job.
- Shall be responsible to know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Shall be responsible to know the possible hazard exposure behavior effects, which may be experienced by the authorized entrants.
- Shall be responsible to continuously maintain an accurate count of authorized entrants in the confined space and ensure that the means used to identify authorized Entrants accurately identifies who is in the confined space.
- Shall be responsible to remain outside the confined space during entry operations until relieved by another attendant; (Note: When the employers permit entry program allows attendant entry for rescue, attendants may enter a confined space to attempt a rescue if they have been trained and equipped for rescue operations and if they have been relieved by another Attendant).
- Shall be responsible to establish and maintain continuous contact (visually verbally, whistle, tag line, etc.) with entrants. This contact is required to monitor entrant status and to alert entrants of the need to evaluate the space.
- Shall be responsible to summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from confined space hazards. The communication shell be made, which will be in direct contact with the Site Manager, HSE Manager and Site Rescue Team.
- Shall be responsible to monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the confined space immediately.

4.0 Procedure

Confined Space means any enclosed or partially enclosed space located either above or below ground or deck level where entry is possible and where there is a risk of oxygen deficiency/enrichment, or the accumulation of dust or gases which are flammable or hazardous to a person(s) health. Entry into these, or any other confined spaces refers not only to complete body entry but also to partial entry when the head is inserted into the confined space via a manhole or opening.

Three criteria needed to define a confined space are:

- Large enough to bodily enter and perform work, and
- Has limited or restricted access or egress, and
- Not designed for continuous human occupancy

Some examples of confined spaces, which may be applicable, are:

- Storage tanks, process Columns, Vessels, Exchangers, Tank like Compartment and Equipment Skirts that only have a manhole for entry, ceiling and floor spaces.
- Open topped spaces such as pits, grease traps, or excavations more than 1.8 m deep.
- Pipes, pumps, sewers, shafts, ducts, drains, tunnels, cellars, basements, and similar structures.

Entry into a confined space for any purpose shall only be as a result of all other practical means of resolving the problem being exhausted and or deemed impractical.

SABQ shall maintain a system of authority and responsibility for establishing written procedures covering work in confined spaces in order to:

- Understand the Confined Space entry permit system.
- Familiarize personnel with the hazards that may be present in confined spaces.
- Train personnel to employ the appropriate safeguards for controlling such hazards.
- Train personnel in the use of test equipment for monitoring those hazards.
- Ensure the provision of qualified and authorized supervision of work in confined spaces to ensure that work is conducted safely.
- Establish emergency plans with the appropriate level of training including emergency rescue, injury management, basic first aid and use of self-contained breathing apparatus.
- Audit and verify subcontractor's compliance with the provisions of the CONTRACTOR confined space entry procedures.

4.1 Hazards Associated with Confined Space

The hazards that arise from work in confined spaces are due to a combination of the confined nature of the place of work and the presence of substances or conditions, combination of which can possess serious threat to the exposed worker. The most likely hazards to be encountered in confined spaces are:

Flammable Substances: This presents a risk of fire or explosion.

Oxygen Enrichment: Can render materials flammable that are otherwise non-flammable and will greatly increase the risk of fire or explosion (oxygen level greater than 23.5%).

Oxygen Deficiency: This may result from:

- Purging of the confined space with an inert gas to remove flammable or toxic gas, fume, vapor or aerosol.
- Naturally occurring biological processes that consume oxygen.
- Naturally occurring biological processes that can produce an inert gas.
- Oxidation of the interior surface of an enclosed vessel over a period of time.
- Carbon dioxide emissions from wet limestone chippings.
- Burning operations that consume oxygen including welding and grinding.
- Displacement of air during pipe freezing, for example with liquid nitrogen.
- Gradual depletion of oxygen as workers breathes in a confined space and where provision of replacement air is inadequate.

Sr. No.	Oxygen Levels	Description of Levels
1	19.5%	Minimum acceptable oxygen level.
2	15-19%	Decreased ability to work strenuously, Impair coordination, Early symptoms.
3	12-14%	Respiration increases, Poor judgment.
4	10-12%	Respiration increases, Lips blue.
5	8-10%	Mental failure, Fainting, Nausea , Unconsciousness, and Vomiting.
6	6-8%	8 minutes - fatal, 6 minutes - 50% fatal, and 4-5 minutes - possible recovery.
7	4-6%	Coma in 40 seconds. Death

Table: Oxygen Deficient Atmospheres

Toxic fumes, Chemicals or Vapor: Which may:

- Be left over from previous processing or storage.
- Arise from disturbance of sludge or scale (even after cleaning).
- Leak from behind vessel linings.
- Be produced by work in the confined space, such as welding, flame cutting, lead lining, and brush and spray painting, molding using glass reinforced plastic, and use of solvents or adhesives or from the products of combustion.
- Chemical analysis of substances shall be conducted to ensure the properties of chemicals. For Oil & Gas / Petrochemical industry presence of NORM (Naturally Occurring Radioactive Material) shall also be confirmed.
- Result from the application of heat to the exterior surface.
- Enter the space from outside, such as exhaust fumes from mobile equipment.

- Build-up following leaks in refrigeration systems or from compressed gas cylinders.

Ingress or Presence of Liquids: in the confined space may cause asphyxiation, drowning or other serious injury, depending on the nature of the liquid.

Free Flowing Solids: Can submerge a person and prevent them breathing.

Presence of Excessive Heat: Can lead to a dangerous rise in body core temperature, and may be exacerbated by any personal protective equipment worn. In extreme cases, heat stroke and unconsciousness may result. This can occur where equipment such as boilers or furnaces have not been given sufficient time to cool or where equipment has been steam cleaned.

Presence of Excessive Cold: Can lead to a dangerous drop in body core temperature, and may be aggravated due to lack of adequate PPE, which can lead to death.

4.2 Training

The employee site orientation training provided to each employee upon initial assignment to a job site shall include sufficient instruction to prevent unauthorized entry into a confined space.

Employees prior to, initial assignment as an Entrant, Attendant, and Rescuer shall successfully complete a formal training session and/or Job Supervisor for confined space operations.

Training content shall include the following:

- Site-specific, written Confined Space Procedure.
- General duties of Job Supervisor, Authorized Entrants, Attendants, and Rescuer.
- Demonstration of hazards associated with confined spaces.
- Risk assessment and control measures procedures for confined spaces.
- Standards, legislative and internal requirements.
- Refresher training shall be completed on an annual basis.
- The training shall establish employee proficiency in their required duties and shall introduce new or revised procedures, as necessary. Each training session shall be accurately documented.

Those likely to be involved in any emergency rescue must be trained for that purpose. The training needs for each individual will vary according to their designated role. It is important that refresher training is organized and available on a regular basis.

When developing training requirements consideration must be given to:

- The likely causes of emergencies.

- Use of rescue equipment such as breathing apparatus, lifelines and, where necessary, a knowledge of its construction and working.
- The checklist of procedures to be followed when donning and using breathing apparatus.
- First aid and use of the first aid equipment provided.
- Use of fire-fighting equipment.
- Liaison with emergency specialists who may be called in including provision of relevant information about conditions and risks and provision of space so that they can carry out their tasks.

4.3 Safe System of Work & Requirements

All information regarding the confined space should be available and considered during the Risk Assessment at the planning stage of job, such as engineering drawings, working plans, and data on relevant soil or geological conditions.

Consider what might be present or not present that could affect work in the confined space such as:

- Previous contents
- Residues
- Contamination
- Oxygen deficiency
- Oxygen enrichment
- Physical dimensions

The confined space shall be isolated (as per PTW system) to prevent dangers arising from elsewhere especially the ingress of substances.

Emergency rescue arrangements shall be done for foreseeable incidents. Possible emergencies must be anticipated.

Conditions necessary for safe work in or around a confined space will vary depending on its location, configuration and use. After all potential hazards have been identified using the job safety analysis process the additional safeguards prescribed in this chapter shall be adopted as a minimum requirement.

4.3.1 Permits (PTW)

A Confined Space Entry Permit **(HSE-SOP-011, HSE-FRM-026)** along with **work permit (Cold and/or Hot)** is required for the protection of personnel entering vessels, tanks, furnaces, sewers, pits over one meter deep. Protection is required against hazards such as flammable vapors, oxygen deficiency, toxic atmospheres, excessive temperatures, power driven equipment, etc.

Applications for confined space entry permits will be submitted by performing parties to HSE/PTW Coordinator at least 24 hours prior to the proposed commencement of the works.

Client Permit to Work System Procedure can be used or if the client does not have a permit to work system, the SABQ Permit to Work System shall be used.

A copy of the permit will be maintained at the work-site at all times while confined space activities are in progress. These permits will be valid only for one (1) working day and can be extended to the next succeeding shift after thorough checking of the confined space requirements and must be revalidated at the start of each shift.

The job supervisor for the Subcontractor and the SABQ Supervisor will be responsible for ensuring all conditions of the permit are complied with. A confined space entry checklist will also be located at the workplace and will be checked off daily by the Job Supervisor to ensure all safeguards are maintained throughout the duration of the confined space activities.

4.3.2 Isolation

The confined space shall be isolated from all potential dangers such as ingress of fumes etc. by positive isolation including blinding; disconnecting or blanking all lines connected to the confined space or by other approved means.

4.3.3 Ignition Sources

All possible ignition sources shall be removed from the immediate area where the installation or application of flammable or combustible substances is required within the confined space.

4.3.4 Electrical/Hydraulic Lock Out - Tag Out

Any equipment located within the confined space that is electrically or hydraulically driven shall be de-energized or depressurized and the isolations of such equipment tagged and locked in accordance with the SABQ Lock Out/Tag Out guidelines in PTW procedure.

4.3.5 Heat Stress

A system of work that allows personnel relief from working in areas of constant elevated temperatures shall be adopted. In such situations it may be necessary to include in the work process regular work/rest breaks or alternatively have two crews so as to enable the work to proceed with crews alternating.

Where possible the temperature within the confined space should be reduced by means of ventilation or the introduction of cool air.

4.3.6 Radiation

All sources of radiation will be removed from the area or positively shielded to avoid radioactive contamination of the confined space.

4.3.7 Atmospheric Gas Testing and Monitoring

All confined spaces will be gas tested prior to entry and at pre-determined intervals. The frequency of such tests shall be documented on the confined space entry certificate. Results of such tests will also be documented on the permit. All gas testing will be undertaken by a 3rd party certified Gas Tester who has been trained in the use of such testing equipment and can interpret results correctly.

Tests will be conducted in such a manner that will ensure all areas of the confined space are free of harmful gases and are not oxygen deficient or enriched. Personnel will not be permitted to enter any confined space where the oxygen content is below 19.5% or above 23.5% by volume.

All testing equipment used for confined space monitoring shall be regularly maintained, serviced and calibrated. It must be suitable for the type of test required and of an approved type.

In order to enter any confined space without the use of special types of PPE, such as a self-contained breathing apparatus (SCBA), atmospheric conditions must have these characteristics:

- **Oxygen:** 19.5 percent to 23.5 percent.
- **Flammability:** Below 10 percent of the lower flammable limit (LFL) for gases, vapors, mists or combustible dust.
- **Toxic gases:** Below the permissible exposure limit (PEL)/threshold limit value (TLV) or time-weighted average (TWA) of a substance.
- **Toxicity:** Less than the permissible exposure limit (PEL) as established on the material safety data sheets (MSDS's).

Concentration levels and the symptoms of exposure to different level of concentrations of various hazardous gases are given below in the tables.

Concentration Level of H_2S (ppm)	Type of Exposure Limit	Symptoms/Physiological Response.
0.3 ppm	Smell starts	Begin to smell like rotten egg.
1 ppm		Increase in anxiety
5 ppm – 10 ppm		Relatively minor metabolic changes in exercising individuals during short-term exposures.
10 ppm	WEL, LTEL, PEL	Long Term Exposure Limit for 8 hours of work. Beginning of eye irritation.
15 ppm	STEL	Short Term Exposure Limit for 15 minutes of work. Possible fatigue, loss of appetite, headache, dizziness.
20 ppm	Ceiling limit	Maximum exposure in any condition.
50 ppm-100 ppm		Slight conjunctivitis ("gas eye") and respiratory tract irritation after 1 hour. May cause digestive upset and loss of appetite.
100 ppm	IDLH	**Immediate Danger to Life and Health.** Coughing, irritation, loss of smell. Gradual increase in severity of symptoms over few hours can cause death.
500 ppm-700 ppm		Staggering, collapse in 5 minutes. Death in 30min.
700 ppm – 1000 ppm		Rapid unconsciousness, "knockdown" or immediate collapse and death in minutes.
1000 ppm above		Instant Death

Concentration Level of CO (ppm)	Symptoms/Physiological Response
10 ppm	Asymptomatic
35 ppm	Long term exposure limit for 8 hours, time weighted average
70 ppm	Shortness of breath on vigorous exertion; possible tightness across the forehead, slight effect on blood vessels.
120 ppm	Shortness of breath on moderate exertion; occasional headache.
200 ppm	Ceiling limit with exposure for 5 minute. Constant headache, irritable; easily fatigued; possible dizziness.
350 ppm – 520 ppm	Headache, confusion, collapse, fainting.
800 ppm – 1220 ppm	Unconsciousness, respiratory failure, death if continuous exposure.
1950 ppm	Rapid fatality.

Table: Carbon monoxide Concentration Level

Concentration Level of SO_2 (ppm)	Symptoms/Effects
2 ppm	Long term exposure limit for 8 hours of time weighted average. Pungent smell
5 ppm	Short term exposure limit. Strong suffocation.
6 ppm – 12 ppm	Nose and throat irritation occur.
20 ppm	Chronic respiratory symptoms occur.
100 ppm	Coughing, irritation to eyes, nose, throat.
400 ppm – 500 ppm	Life threatening

Table: Sulfur Dioxide Concentration Level

4.3.8 Ventilation

Ventilation where necessary will be provided by either natural or mechanical means. In vessels/tanks where there has been a presence of hazardous substances, the confined space will be force ventilated for 24 hours prior to entry. All such vessels/tanks will be thoroughly examined prior to entry to ensure there is no longer any contamination by the presence of hazardous substances.

4.3.9 Personnel Protective Equipment (PPE)

All relevant personal protective equipment applicable to the task being performed shall be provided and the wearing of such equipment shall be mandatory. Such equipment shall consist of but may not be limited to the following:-

- Personal Monitors (e.g. H_2S, O_2 and Hydrocarbons)
- Safety Helmet
- Safety Spectacles (Clear Type)
- Safety Harness and Lifeline
- Safety Footwear
- Industrial Safety Gloves
- Extraction Fans
- Hearing Protection
- Self-Contained Breathing Apparatus (where necessary)
- Other respiratory protective equipment as required

All tasks shall be completely assessed using the job safety analysis technique prior to commencement. Tasks will also be regularly reviewed via Tool Box Meetings.

4.3.10 Confined Space Attendant/Hole Watch

The Supervisor in direct control of the works will determine the number of attendant personnel required for the task.

He shall also ensure that the attendant/hole watch must possess a Confined Space Attendant Authorization Certificate **(HSE-SOP-011, HSE-FRM-27)** before commencing his job. This certificate shall be provided after the required training mentioned in section 4.2 of this procedure, to the attendant.

Stand by Man (Confined Space Attendant) shall be placed at the entrance of confined space whose duties are following:

- Maintaining control and record of entry into/out of the confined space on **Annexure B - Confined Space Entrant Log Sheet**.
- Maintaining contact with the Area In-charge and/ or emergency response team.
- Communicating with work party (either visually by direct vision, camera, with rope or by radio).
- Barricading area around the confined space entry point and keeping unauthorized persons out of this area. Making sure that barricades and warning signs are in place during breaks and at the end of the working day ("No Entry" sign in the man-hole).
- Raising the alarm by alerting rescue team in case of emergency inside the confined space.
- Rendering assistance until help arrives by applying the basic rescue rules that one has to protect himself before attempting any rescue.

The Attendant (SBM) must be dedicated to the above duties and must not act as a supervisor.

4.3.11 Fire Protection

Adequate fire protection suitable to the hazards involved shall be provided at all work locations. Number and type of fire extinguishers or equipment shall be determined by the HSE department.

Prior to the commencement of any hot works all combustible material shall be removed from the area or areas where hot work is to be undertaken.

Prior to personnel entry into a confined space, it may be necessary to disable any fire extinguishing system, such as inert gas flooding, which may pose a hazard.

Care should be taken when deciding whether or not the ventilation system should be switched off in case of fire. Leaving the ventilation on means that people are continually supplied with fresh breathing air and that contaminants are swept out of the space. However, fresh air also fans the flames and makes the fire grow.

Any decision to switch off a ventilation system in the event of a fire must only be taken by a suitably experienced and competent person, taking into account all material considerations.

4.3.12 Lighting/Electrical Equipment

The use of electrical equipment inside confined spaces must be strongly discouraged; however, where this is not possible, a low voltage lighting and electrical toll shall be used.

Adequate and suitable lighting 12V or 24V, (including emergency lighting in case of failure of power to the main lights) must be provided. The lighting units will require special protection if there is the risk of flammable or explosive atmospheres, i.e. all electrical equipment, including lighting, must be suitable for all atmospheres that could be encountered.

Only air must be used to drive pneumatic tools in confined spaces (except when the atmosphere is inert).

Explosion (intrinsically safe) proof lighting, torches, tools and equipment must be used for potentially flammable areas.

All cables should be run through alternate opening(s) or be tied up & padded or insulated through the entry point to prevent contact and damage to cables.

All portable hand held tools pneumatically operated shall be fitted with a dead man Control switch.

4.3.13 Suspension of Work

HSE representative will exercise the right to cease any confined space activity should all requirements within these procedures not be complied with. The supervisor directly in control of the work and or the attendant/hole watch shall exercise the right to cease such activities should any adverse situation, whether inside or outside the confined space, arise which may affect the health and safety of personnel within the confined space. Should either situation mentioned above arise, employees will be instructed to evacuate the confined space until the problem is resolved to the satisfaction of the HSE representative.

4.3.14 Means of Access/Egress from Confined Space

Adequate access to and egress from all confined spaces will be provided using either ladders, scaffolding or purpose made access platforms. The confined space working area will be organized in such a manner so as to provide as much unhindered work space as practicable. While personnel are actually inside the confined space the attendant/hole watch will maintain constant contact with the employees by either visual observation or verbal communication.

4.3.15 Selection of Personnel

All personnel selected to enter any confined space environment will have attended the confined space entry training program. All personnel selected to act as an attendant will have attended the Hole Watch training program. In both cases all individuals will be fully conversant with the operation of all emergency rescue equipment and equipment required to carry out the task safely.

4.3.16 Unauthorized to Confined Space

Whenever a confined space is left unattended and unoccupied the confined space shall be adequately posted with signs to prevent unauthorized entry.

4.3.17 Warning Signs

The Job Supervisor shall insure that an appropriate warning sign has been located near all entrances into a confined space prior to starting work. The warning signs shall remain in place until the work activities are completed and while any normally closed entrances are open. The recommended wording for the warning signs is:

4.3.18 Gas Purging and Water Flushing

Where flammable or toxic gases or vapors are present, or possibly present, it is necessary to purge the gas or vapor from the confined space. This can be done with air, inert gas purging and / or through water flushing. After the Purging/ Flushing, the atmosphere must be tested to check that purging/flushing has been effective and that it is safe to breathe, before allowing people to enter.

In circumstances where the safest method of removing a flammable or explosive hazard is by purging with inert gas, then a PTW & attached Risk Assessment must identify the standard of protection of all exposed persons. This shall include the use of full breathing apparatus (e.g. use of air manifold or SCBA's).

Good ventilation and a supply of breathable air shall be mandatory for working in confined space.

4.3.19 Portable Gas Cylinders

Portable gas cylinders must never be introduced into confined spaces, unless there is no practicable alternative. In such cases, special precautions must be taken to deal with the potential hazards, including gas leakage. A good level of ventilation must be provided within the confined space and all equipment must be checked for leaks.
At the end of every work period, gas cylinders must be removed, including those from welding sets, to eliminate the risk of a small leak contaminating the confined space atmosphere.

4.3.20 Emergency Procedures and Requirements

In planning for emergencies one must consider those that may result directly from the confined space entry operations, but also those that may occur in other parts of the plant/facility and have an impact on the on-going confined space entry operations.

No person must enter or carry out work in a confined space unless specific arrangements have been made for their rescue and these arrangements are in place.

Those responsible for organizing and supervising confined space work must develop rescue arrangements, taking into account the nature of the confined space, the identified hazards and the likely nature of an emergency where rescue is required. Rescue may not only be required for an incident specific to the confined space, but also as a result of more general types of incidents, such as incapacitation after a trip, or a medical emergency.

The following requirements apply to employers who have employees enter confined spaces to perform rescue services:

- The employer shall ensure that each member of the rescue service is provided with, and is trained to use properly, the personal protective equipment and rescue equipment necessary for making rescues from confined spaces.
- Each member of the rescue service will be adequately qualified through a third part training course in Confined Space Rescue.
- Each member of the rescue service shall be trained in basic first aid and cardiopulmonary resuscitation (CPR). At least one member of the rescue service should have current certification in first aid and in CPR.
- Inform the rescue service of the hazards they may confront when called on to perform rescue at the employer's facility.
- Provide the rescue service with access to all confined spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.

4.3.21 Communication

An adequate communication system shall be provided:

- Between those inside the confined space and those outside.
- To call help in case of an emergency.

The communication system selected must enable the clear unambiguous relay of messages. The communication system must also be appropriate for any personnel wearing respiratory protection. Intrinsically safe radio set shall be used in the presence of flammable material in environment.

4.3.22 Competence

To be competent to work in confined spaces, adequate training and experience are essential. Training standards must be appropriate for the task and to the individual's roles and responsibilities. Where personnel need to work for periods without direct, on-site supervision, they must be competent to follow the established safe system of work.

4.3.23 First Aid

Appropriate first aid equipment must be provided ready for use. Sufficient personnel trained in first aid must be readily available until professional medical help arrives.

4.4 Confined Space Activities

4.4.1 Erection of Equipment

Equipment such as oil storage tanks, pressure vessels, columns etc. will be erected using a mobile crane. For erection of all equipment's scaffolding will be erected in the bottom of the ground level to take up the entire void and provide a suitable platform to facilitate the installation of the equipment's.

Scaffolding will be inspected and tagged prior to use.

4.4.2 Hot Work (Cutting, Welding & Grinding)

During any welding or cutting activities there will be sufficient artificial air movement such as blowers are installed at the required positions to ensure fumes are forced out of the confined space and breathable air is continuously replenished. The suction of supply blower should be

kept away from source of exhaust and fumes. In summer, cooling systems will be used to bring down the temperature inside the confined space.

During any cutting or welding, gas cylinders providing gases for welding or cutting will be secured in an upright position outside of the vessel and away from the entry point. At all times upon the completion of welding and cutting, the hoses and hand piece of the gas cutting/welding equipment will be removed from the confined space to prevent the inadvertent escape of gases into the confined space.
Any welding or cutting activities taking place in close proximity of the entrance to the confined space where there may be a possibility of contaminating the confined space will be suspended until work within the confined space is completed.

4.4.3 Use of Solvents, Chemicals and Argon Gas

Prior to the use of any solvents or chemicals inside any vessel all requirements stated on the material safety data will be met. These requirements will be entered on the permit and fully explained by the Job Supervisor to the permit receiver.

Additional requirements deemed necessary due to the confined nature of the working environment, combined with the potential for high concentrations of hazardous substance, will be determined by the PTW Coordinator in conjunction with the HSE representative.

Typical requirements may include but not be limited to respiratory protection, intrinsically safe tools etc. details of which shall be entered on or attached to the work permit.

The provision of such requirements will be inspected and approved by the SABQ HSE Department prior to use.

5.0 References

- ISO 45001:2018 OHS
- ISO 14001:2015 EMS
- Health and Safety Executive – UK
- Management of Health and Safety at Work Regulations
- Occupational Safety & Health Administration (OSHA) USA
- ADNOC – HSE Management System Guidelines

6.0 Attached Documents

- Annexure-A: Job Supervisor Checklist for Confined Space
- Annexure-B: Confined Space Entrant Log Sheet
- HSE-FRM-026: Confined Space Entry Certificate
- HSE-FRM-027: Confined Space Attendant Authorization

JOB SUPERVISOR CHECKLIST FOR CONFINED SPACE

Annexure A; HSE-SOP-013; REV: 00; 04-07-2024

Project Title:	Job Location:
Supervisor Name:	Date & Time:
Work Description:	

To be completed/checked by Job Supervisor before starting work			
Sr. No	**To Check**	**Yes**	**No**
1	Entrants/supervisor has the training for this task?		
2	Is there the necessary work-permit?		
3	Are you familiar with the SABQ procedures for entering confined spaces?		
4	Do you fully understand your specific responsibilities in respect of this task?		
5	Are you and the workforce wearing the appropriate personal protective?		
6	Have you arranged for the appropriate fire protection and safety equipment?		
7	Are all connections to the confined space isolated/removed?		
8	Are all electrical/hydraulic connections in and outside the confined space locked-out and tagged?		
9	Are there radiation hazards?		
10	Is the confined space hazardous gas free?		
11	Is the oxygen level satisfactorily?		
12	Are there physical hazards in the confined space?		
13	Is the workforce (those who enter the space and attendants) familiar with the necessary safety procedures?		
14	Have lifelines or harness been provided?		
15	Does the electrical equipment meet requirements?		
16	Is the attendant/standby person(s) aware of his/her duties regarding communication with and rescue from the confined space?		
17	Will continuous monitoring take place during work to ensure confined spaces gas free and have sufficient oxygen?		
18	Do you know whom to refer to in the case of uncertainty?		
19	Is there an approved Rescue Plan in place and understood by all involved in the entry?		

Sign: _____

SABQ DESIGN & BUILD
SABQ Energy Contracting Group Co. LTD

CONFINED SPACE ENTRANT LOG SHEET

Project Title:	Job Location:
Standby Person:	Employee #
Equipment #	Date:
Work Description:	

Sr. No	Name	Company	Emp. #	Time In	Time Out	Time In	Time Out	Entrant Sign.
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

HSE Representative

Name:_____

Sign._____

Date:_____

Job Supervisor

Name: _____

Sign. _____

Date: _____

SABQ DESIGN & BUILD
SABQ Energy Contracting Group Co. LTD

CONFINED SPACE ENTRY PERMIT

Document No.	Release Date:	Revision	Page
HSE-FRM-026	July4, 2024	00	1 of 1

Company Name:	☐ SABQ	☐ Subcontractor Name:	Permit No. CSEP-

Section 1: Job Details

Issue Date:		Issue time:	Associated Permit No.			
Expiry Date:		Expiry Time:	Project #			
Equipment Name & Tag No.	Area Classification		Zone			Isolation Certificate #
	☐ Hazardous	☐ Non-hazardous	0	1	2	
Location/Area/Unit:						
Reason for Entry/Job Description:						

SECTION 2: Equipment to be used

Power brush	Grinder/cutter	Welding tools	Hand tools	Sandblasting equipment	Type of lighting	Others
Mobile Crane	Pneumatic Tools	Jack Hammer	Air Compressor			

SECTION 3: Hazards / Risks

Oxygen Deficiency	Sludge & residue	Hot material/surface	Vapors/gases	Toxic material	Inadequate light	Flammable material
Dust & fumes	Electricity	Skin-chemical hazard	Heat/ventilation	Slip & fall hazard	Oxygen enrichment	Other job specific hazards

Section 4: Control Measures

Safety Checklist	Actions taken		Safety Checklist	Actions Taken	
	Yes	N/A		Yes	N/A
Space drained and decontaminated.			Equipment cooled for entry.		
All chemicals, utilities and outlet lines isolated.			Equipment grounding circuit checked by electrician.		
Confined space purged with water/steam/air/inert.			Emergency Response Tem informed about the job.		
All lines have been spaded as per isolation certificate.			Respiratory equipment available.		
All electrical equipment GFCI protected.			Communication means adequately available.		
Oxygen value within limits (19.5% - 23.5%)			Standby person available and qualified.		
Atmospheric / Gas test conducted and within limits.			Adequate lighting provided as per CS voltage rating(24V).		
Continuous atmospheric / gas testing required.			Sharp edges and moving parts guarded.		
Access and egress unobstructed.			Mechanical ventilation required and provided.		
Has fall protection been provided.			Rescue plan available at site and arrangements made.		
Harness and lifeline worn.			Entrant log sheet available at job location.		
All job specific control measures taken.			CSE sign visible at outlet.		
Job Safety Analysis required			Task Risk Assessment Conducted.		

Section 5: PPE and Other Requirements

	Yes/No/N.A		Yes/No/N.A		Yes/No/N.A		Yes/No/N.A	
Gloves		Eye Protection		Chemical suit		Ladder		Other Job Specific PPE Requirements
Shoes		Escape Hood		Ventilation		Lighting		
Airline		Two Way Radio		Gas Detector		Helmet		
Signage		Fire Extinguisher		Hearing Protection		Fall Arrest		
First Aid		Dust/fume mask		Temporary Platform		Lifeline		

Section 6: Atmospheric Gas Testing & Monitoring

No.	Time	Date	Oxygen (19.5% - 23.5%)	LEL < 10%	H_2S (0ppm)	Other	AGT	Signature
1								
2								

Section 7: Confined Space Entry Certificate Issuance

THE CONFINED SPACE DESCRIBED ON THIS PERMIT IS IN OUR OPINION SAFE TO ENTER USING PRECAUTIONS LISTED ABOVE. WE HAVE INSPECTED THE SITE AND ALL THE ACTIONS AND CONDITIONS NECESSARY FOR SAFE ENTRY HAS BEEN PERFORMED.

	Name	Job Title	Date	Signature
Area Authority				
Performing Authority				
Issuing Authority				

Section 8: Job Completion

WORK HAS BEEN COMPLETED AND AREA HAS BEEN LEFT SAFE AND CLEAN. ALL BARRICADES AND MATERIAL HAVE BEEN REMOVED AND EQUIPMENT IS AS PER OPERATIONS REQUIREMENTS

	Name	Job Title	Date	Signature
Area Authority				
Performing Authority				
Issuing Authority				

SABQ DESIGN & BUILD SABQ Energy Contracting Group Co. LTD	CONFINED SPACE ATTEDANT AUTHORIZATION			
	Document No. **HSE-FRM-027**	**Release Date** **July4, 2024**	**Revision** **00**	**Page** **1 of 1**

Employee Name:	**Job Title:**
Employee #	**Date of Training:**
Company:	**Trainer:**

Confined Space Attendant Authorization

This is to certify that Mr._____, Employee No._____has been given essential training for Confined Space Attendant. He has been communicated about his responsibilities as an attendant. He is now authorized by SABQ to work as a Confined Space Attendant.

- ☐ I am familiar with and understand the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- ☐ I am aware of possible behavioral effects of hazard exposure on authorized entrants.
- ☐ I shall continuously maintain an accurate count of authorized entrants in the permit space on the CSE log sheet.
- ☐ I shall remain outside the permit space during entry operations until relieved by another attendant.
- ☐ I shall communicate with authorized entrants as necessary to assess entrant status and to alert entrants of the need to evacuate the space.
- ☐ I shall assess activities and conditions inside and outside the space to determine if it is safe for entrants to remain in the space or order the authorized entrants to evacuate the permit space immediately under extremely hazardous situations.
- ☐ I shall summon rescue and other emergency services as soon as I determine that authorized entrants may need assistance to escape from permit space hazards.
- ☐ I shall perform non-entry rescues as specified by the employer's rescue procedure.

I_____, Employee No._____acknowledge that I have taken the required training for the confined space attendant. Further, I acknowledge that I will am responsible for the above given responsibilities.

Signature:_____ Signature: _____

Employee **Trainer**

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

VEHICLE TRANSPORTATION MANAGEMENT

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

This procedure establishes the Land Transportation Management System that shall be implemented in every aspect of motor transport on SABQ activities. The Land Transportation Management Procedure is applicable to all motor transportation related issues associated with design, procurement, fabrication, construction and commissioning, to project completion and hand over of the project to the client. This procedure shall focus on all vehicle and driver requirements relating to the SABQ Projects throughout all phases.

Specific vehicles, heavy equipment and crafts for exclusive use on working sites and workshop, such as cranes, bulldozers, and fork-lift trucks are excluded from this procedure.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of Elite Engineering Private Limited. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

ETA: Estimated time of Arrival.

ETD: Estimated Time of Departure.

Approved Driver: Any person (employee, contractor or sub-contractor) who operates a company motor vehicle, contractor vehicle or sub-contractor vehicle on behalf of the company business.

Carbon Footprints: The amount of carbon dioxide released into the atmosphere as a result of combustion of fuel inside a vehicle engine and the smoke released as a result of it.

Competent Driver: A driver is said to be competent if he/she has sufficient driver's trainings, experience in driving, and knowledge about vehicle and road safety.

Defensive Driving: Defensive driving is a skill of driving to save lives, time, and money, in spite of the conditions around you and the actions of others. This includes following speed limit, giving priority where required to others etc.

Fleet: Number of vehicle working together under same ownership.

Lashing: A fitting or attachment on a vehicle or a load, specifically installed as a point to secure a lashing.

License: A license is issued by a traffic police/authority in respect to the training and driving test cleared by a driver for particular type of vehicle.

Roadworthy: A vehicle that has been inspected and cleared by inspector as fit to be used on road. Vehicle shall be fit electrically as well as mechanically.

Spare Parts: A duplicate part to replace a lost or damaged part of a machine/vehicle.

Transportation Safety: Transportation safety is concerned with the protection of life and property through regulation, management and technology development of all forms of transportation.

Vehicle Incident: A work related incident which results in significant damage to a SABQ's vehicle and/or a vehicle used in the execution of SABQ's business (excluding personal privately owned vehicles) - where the damage causes any injury to any person and/or damage to a third party. Any private / personal vehicle under use for company business shall also fall under this category.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.

- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Shall be responsible to ensure that land transport subcontractor operations meet the required standards.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Representative

- Shall be responsible to scheme and perform the HSE training for the personnel.
- Shall be responsible to ensure that checklists are completed on required basis on all vehicles prior to operation.
- Shall be responsible to measure compliance of this procedure through audits and inspections.
- Shall be responsible to initiate action against violation of this procedure.

4.0 Procedure

The Land Transportation Management Procedure aims to ensure that any vehicle used in project constructions, workshop are suitable for the purpose intended, are completely roadworthy and maintained in a clean and meaningful manner.

A corresponding objective is to ensure that any driver involved with the project, either with the COMPANY, contractor or subcontractor employed is trained to a reasonable level of driving competence and to ensure that the level is maintained throughout the tenure of the project.

More specifically, this procedure targets the following;

- Reduction in Loss of life and Human suffering.
- Improvement in health and reduction in related illnesses.
- Reduction in the risk associated with the transport operations.
- Control and minimization of damage when an incident occurs.
- Contribution to reduce our carbon footprint through better selection and maintenance of vehicles.
- Improvement of operational safety procedures.
- Adoption of common standards within the project.
- Enhancement of SABQ and the project image within the local communities and authorities.

4.1 Land Transportation Management

The project, as an integral part of the HSE Management System, shall instigate a Land Transportation Management Procedure that will define the Driving Rules which in turn will ensure that the following items are managed and clearly documented;

- Vehicles management (selection criteria, replacement policy, safety equipment requirements, etc.).
- Driver and personnel management (selection, training etc.).
- Responsibilities and duties of subcontractor.
- Compliance with Local laws and traffic regulations (Govt. Rules etc.).
- The implementation of active journey management and risk assessment where appropriate.

The main objectives of Land/Vehicle Transportation Management Procedure shall be to improve driving performances and to ensure vehicles are fit for purpose and roadworthy; in order to achieve such an objective the following shall be implemented.

Objectives to improve driving performance are set at regular intervals, as a minimum, at least annually. Specific audits shall be performed by the HSE Manager's designated Supervisor on a regular basis.
Local initiatives to improve driving standards are developed as part of the annual HSE Plan for the project. Safety driving performance is integrated into the individual end of year appraisal.

4.2 Types of Vehicle

There are two main categories of vehicles used for company transportation operations as mentioned below.

4.2.1 Company Owned Vehicles

Any vehicle (car, van, bus, coach, truck, trailer, pickup truck, emergency vehicle (e.g. fire tender, ambulance)) that is directly owned, leased or rented by the company and being operated in connection with company business, including personal vehicles whilst used for company business.

All vehicles owned by company shall be certified fit for use as per company criteria before assigning for any transportation activity.

4.2.2 Contracted Vehicles

Any vehicle that is leased, directly owned, or rented by a contractor, that provides services for the Company operations under formal (contractual) agreement.

4.3 Driver Management

The driver management aspect Vehicle Management Procedure ensures the assessment and selection of drivers are conducted in accordance with the documented management procedure. This management system contains the elements detailed in the below sections. By correct use of this management procedure the competency of the driver can readily be verified.

4.3.1 Drivers Selection & Qualification

Only approved drivers are permitted to operate SABQ Project vehicles and any authorized driver shall hold a valid license for the Host country or accepted by the national authority as being equivalent. Approved drivers shall have SABQ HSE Defensive Driving Training with successfully passed test. It will be mandatory for drivers to permanently keep this training document in their possession at all times when driving and be ready to offer it for inspection to authorized persons, i.e. the Project Manager, the HSE Manager or security staff of the project.

The management systems shall retain a copy of the driver's license in the person's personnel records. In countries where the driving license, or permit, does not include photograph, a second document giving proof of identity will also be kept in the records of the driver.

In all cases, the licenses must be valid for the category of the vehicle being operated by the driver, should there be an infringement of this rule by a driver, his license validity will be reviewed and his suitability to drive on the construction work scope will be re-assessed.

Certain circumstances may demand a locally arranged driver competency test. Such tests would become necessary if the driver, although in the possession of a valid license, displayed any of the following;

- A noticeable lack of driving ability
- Careless or dangerous driving maneuvers
- A lack of respect for the vehicle or passengers

The locally arranged driver competency tests would include driving ability and attitude, rudimentary vehicle knowledge and basic inspection requirements, such as installed safety equipment, oil levels, tires pressures, etc.

All drivers shall be medically fit for the job and a medical certificate shall be systematically delivered by the approved Doctor and renewed on a regular basis, which will be defined by Administration Department. In particular, the sight test including color blind tests are mandatory for all drivers.

4.3.2 Driver Training

Drivers training can only be undertaken under the supervision of an appropriately qualified person, and only when authorized by the HR Department. It shall be the responsibility of the HR Department to ensure that progressive training for defensive driving is made available to all people in land transportation. Additional training will be required for four wheel driving, including, off-road, for specific persons whose duties involved such specialized transportation.

Drivers assigned for personnel transportation must have their competency regularly assessed. The project recommendation is that these re-assessments are conducted on an annual basis, and the re-assessment procedure is to be endorsed by the HSE Manager and implemented under his supervision. Every reassessment shall be duly validated and recorded in the personnel records.

The general education of drivers will also be assessed in order to verify that user manuals, signs, policies and rules can be readily understood.

Drivers assigned to the transportation of dangerous goods or hazardous substances shall have a valid, appropriate and specific license and their driver competency shall be regularly re-assessed as for the drivers transporting personnel. For training details see section 5.0 of this procedure.

4.3.3 Driver Responsibilities

It shall be the driver's responsibility to ensure that only passengers, authorized by the Administration department, may be transported on board Company's vehicles.

Driver's main responsibilities are the following;

- Always obey the Speed Limits & Safety rules as mentioned on the safety signs.
- Wear a seat belt at all times.
- Always use the directional signals.
- Ensure all other occupants of the vehicle are wearing seatbelts.
- Wear sturdy footwear when driving (not slippers, flip-flops or loose sandals).
- Wear the correct PPE if working with hazardous materials.
- Ensure luggage is securely fastened and stowed correctly.
- Conduct the pre-check before riding the vehicle.
- Ensure that emergency equipment/contents are available in vehicle.
- Ensure all doors are closed correctly before moving off.
- Ensure all passengers are wearing seatbelts before moving off.
- Use only assigned driver blue key, never lend your blue key to any one or leave inside the vehicle.
- Never drive if too tired to concentrate.
- Never drive if under the influence of alcohol, drugs or medication.
- Only use a vehicle that has been approved for the journey.
- Use Journey Management System.
- Vehicles must not be left unattended with the engine running.
- Report all vehicle related accidents / near misses.
- Ensure that they are licensed for the vehicle that they are operating.
- Drive safely and show consideration to other road users.
- Switch off vehicle engine and mobile phone when re-fueling.
- Do not use mobile phone while operating a motor vehicle. Free headset can be used to receive emergency calls only, to place or receive a call: park your vehicle safely and use your mobile phone and radio communication.

Vehicle Inspection shall be carried out in accordance with **"Vehicle Inspection Checklist (HSE-FRM-016"**. See attached documents.

4.4 Vehicle Management

Company and its Contractors/Subcontractor's shall ensure that purchasing, leasing and contractual arrangements for vehicles lead to the provision and maintenance of vehicles that are fit for the intended purpose. Only vehicles that are fit for the intended purpose shall be in the project construction, and they must only be operated in accordance with the design specification.

Special attention shall be given to the vehicles safety equipment which will include;

- Three points seat belts
- Adjustable head rest (for all seats)

- Air bags (driver and front passenger as a minimum)
- Reinforced bumpers
- External reversing alarm
- First aid kit
- Fire extinguisher (Dry powder)
- Warning Triangle

4.4.1 Vehicle Maintenance

Company shall ensure that a comprehensive vehicle preventive maintenance program is put in place for all vehicles operated on project sites. All vehicles shall be maintained in accordance with the manufacturer's recommended maintenance program, which is detailed in the vehicle documentation. In the absence of any documentation the vehicles shall be serviced in intervals of at least every three months or 500 km whichever comes first, and the service will include mandatory checks of the vehicle safety systems and equipment, such as tires, brakes, steering and lights.

The effectiveness of the maintenance program will be ensured by regular and specific Inspection performed by the Admin/HSE Department. The frequency of the inspection shall not be less than every six months.

At any time, either during the regular maintenance program, daily checks or random inspection, that a vehicle should be discovered to be not in good roadworthy condition, or any of its safety equipment is not functioning properly, or if it is involve in any type of vehicle incident will be immediately withdrawn from service. Any vehicles withdrawn for these reasons shall not be re-instated for the project until a full comprehensive vehicle examination has been performed and the vehicle is declared to be roadworthy and safe.

The Administration Department shall formally define a program of technical control of the vehicles which will be in accordance with Host country regulations; however in the absence of such, recognized regulations and standards shall be used. The frequency of the regular technical controls shall not exceed two years.

Spare parts required as part of the maintenance program or as normal replacement, shall be supplied by a reputable supplier, and ideally the parts should be the manufacturer's specialized parts.

Tire replacement shall only use high quality, international standard, tires which are the size and type specified in the manufacturer's specification.

4.4.2 Vehicle Traffic Management

SABQ will ensure appropriate planning to make sure that the flow of traffic within the construction area and the nearby communities is adequately controlled. Dispatching of vehicle will be controlled to minimize the hazards associated with the transportation

including road congestion, especially to the neighboring communities. Vehicles producing excessive noise or beyond the noise level standard shall be subject to maintenance.

4.4.3 General HSE Guidelines for Vehicle Activities

As per general driving guidelines, in all kind of road surfaces the drivers shall ensure that:

- All vehicles used shall be fitted with seat belts, administration encourage and ensure the installation and use of seat belts in all personnel vehicles. All belts shall be functioning, inspected regularly and worn correctly by drivers and passengers.
- Night driving shall generally be prohibited and avoided as far as possible and if required then it must be authorized by HR/Admin Department.
- Follow defensive driving requirements.
- Avoid sudden brakes.
- Speed limits and road safety signs should be strictly followed.
- Do not drive during foggy weather, rainy conditions, sand storms and any conditions where low visibility prevails.
- Does not use of mobile phones while driving, ensure seat belt compliance and do not smoke while driving.
- Follow traffic law; any violations will be directly accounted to the respective drivers and fines shall be recovered from individual accounts as in reference to disciplinary actions.

4.4.4 Rules for Parking Vehicle

- Park vehicles in marked spaces only.
- Do not park in spaces that are reserved for authorized people vehicles or emergency response.
- Do not block other vehicle.
- When parking follow the seven rules of safe parking:

  - Always park so, the first move in the vehicle is forward – you may have to reverse park at the end of your trip, if so, make sure that the rear is clear.
  - Sound the horn before you start to reverse.
  - Back immediately, never trust the scene you checked to stay the same.
  - Back slowly.
  - As you back, check both side-mirrors.
  - Don't back further than necessary.
  - Use a ground guide.

4.5 Logistic Management

Logistics safety management shall be planned and carried out by ensuring that the following requirements are fulfilled and implemented as mentioned below:

I. Prequalification of transporters/ suppliers.
II. HSE Planning for Logistics operations.
III. Logistics Journey Management.

4.5.1 Logistic Inspection

The logistic inspection ensures that the fleet and the driver are in conformance to the project, operations and safety requirements for that particular trip. If any faults identified at this stage need to be rectified prior to dispatching the vehicle for the assigned trip. The pre-journey inspection of vehicle is conducted in accordance with **"Logistics Inspection Checklist (HSE-FRM-017)"**. See attached documents.

4.5.2 Logistic Transportation

While transporting the load, Admin/Warehouse/HSE representative shall ensure to secure the load safely throughout the trip. Logistics suppliers/Vendor driver/ helper are responsible to ensure the loaded items are secured using high quality polyester lashing belts and metal chains. The loaded material inspection shall be carried out in accordance with **"Lashing Inspection Checklist (HSE-FRM-019)"**.

4.5.3 Wide Load (Oversized Cargo) Transportation

Any movements of wide loads (which extend beyond the body of the transport vehicles and encroach into the oncoming traffic lane or shoulder of the road) are required to have authorization from Admin/HSE departments and the Local authorities (if will be passing into public road) prior to commencing.

The in-charge section shall make a written request to be submitted with a minimum of 48 hours' notice. This written request must include the following;

- Date and Time of expected movement
- Name of responsible person for safe movement
- A clear map of the intended route
- Method of temporarily closing the roads (if required)
- Method of traffic control (flagmen, escort vehicles. Lights, etc.)

The responsible person named in the request must accompany the movement to ensure maximum safety of personnel, including civilians if involved.

The loaded oversized material inspection shall be carried out in accordance with **"Oversized Cargo Inspection Checklist (HSE-FRM-018)"**.

4.5.4 Journey Management

Company shall implement a journey management system to be applied for four wheel drives, off-road excursions, or where journeys are undertaken in isolated environment or well-

known high risk areas. The active planning and management of such journeys shall include a documented risk assessment, performed to identify hazards, mitigation and control of those hazards, provision of an emergency survival pack, appropriate communications and an emergency response plan. There will be no exceptions to this rule. As part of the journey management a responsible person shall be designated to monitor the safe progress of any such journey, and he must be advised of the Expected Time of Arrival (ETA) and Expected Time of Departure (ETD) of the schedule related to journey.

4.5.5 HSE Guidelines for Logistic Operations

- Seat belts shall be worn by both driver and co passenger at all the time during travel.
- All large logistics vehicles (trailers) shall be fitted with reverse alarms.
- For the long distance missions the driver shall check and ensure the working of lights, indicators, break system, tire pressure as minimum.
- For every 100 kilometers the driver shall check and ensure the integrity of securing lash belts and positioning of the cargo materials.
- For interim rests and any other requirement, the driver shall stop and park the vehicle on a lawful manner in line with traffic law.
- Clear the area in order to ensure safe overtaking if required. Proper turning room and good visibility for the drivers shall be ensured.
- All heavy duty trucks shall be parked in a safe place as per instruction of materials coordinator/ In-charge ware house.
- Keep and maintain safe distance between the vehicles.
- In case of any oversize cargo transport, convoys (if applicable) will be deployed as per the local rules and regulations to ensure the safety during transport.
- For interim rests and any other requirement, the driver shall stop and park the vehicle on a lawful manner in line with traffic law.
- Clear the area in order to ensure safe overtaking if required. Proper turning room and good visibility for the drivers shall be ensured.
- All heavy duty trucks shall be parked in a safe place as per instruction of materials coordinator/ In-charge ware house.
- Keep and maintain safe distance between the vehicles.
- In case of any oversize cargo transport, convoys will be deployed as per the local rules and regulations to ensure the safety during transport.

4.6 Emergency Preparedness

- First aid box shall be made available on the vehicle.
- Fire extinguishers to be made available in the fleet to use in case of fire.
- Three sets of reflective triangles are provided to each vehicle to be used in case of an emergency break down.
- All logistics vehicle traveling in remote areas shall have suitable means of communication, either radio or mobile phones.

5.0 Training

HSE Induction shall be provided to all drivers before assigning to jobs. Driver shall be trained on the principles of the defensive driving techniques. Periodic safety briefings, meetings and refresher trainings shall be conducted for drivers when and as required.

As a minimum the following topics shall be covered in the defensive driving training conducted for drivers:

- Company HSE policy.
- Defensive driving techniques.
- Journey management techniques.
- Alertness and fatigue management.
- Effects of medication and substance abuse.
- Vehicle restraint systems and safety equipment.
- Pre-trip checks and proper seating position.
- Local driving hazards, regulations and culture.
- Skill assessment and/or commentary drive.
- Emergency response planning and prepared.

6.0 References

- Occupational Safety & Health Administration, USA
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ADNOC – HSE Management System Guidelines

7.0 Attached Documents

- HSE-FRM-016: Vehicle Inspection Checklist
- HSE-FRM-017: Logistic Inspection Checklist
- HSE-FRM-018: Oversized Cargo Inspection Checklist
- HSE-FRM-019: Lashing Inspection Checklist

5.0 Training

HSE Induction shall be provided to all drivers before assigning to jobs. Driver shall be trained on the principles of the defensive driving techniques. Periodic safety briefings, meetings and refresher trainings shall be conducted for drivers when and as required.

As a minimum the following topics shall be covered in the defensive driving training conducted for drivers:

- Company HSE policy.
- Defensive driving techniques.
- Journey management techniques.
- Alertness and fatigue management.
- Effects of medication and substance abuse.
- Vehicle restraint systems and safety equipment.
- Pre-trip checks and proper seating position.
- Local driving hazards, regulations and culture.
- Skill assessment and/or commentary drive.
- Emergency response planning and prepared.

6.0 References

- Occupational Safety & Health Administration, USA
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ADNOC – HSE Management System Guidelines

7.0 Attached Documents

- HSE-FRM-016: Vehicle Inspection Checklist
- HSE-FRM-017: Logistic Inspection Checklist
- HSE-FRM-018: Oversized Cargo Inspection Checklist
- HSE-FRM-019: Lashing Inspection Checklist

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

WELDING, CUTTING & GRINDING (HOT WORKS)

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

The purpose of this procedure is to establish guidelines in order to ensure that all cutting, grinding and welding (hot work) activities are carried out with minimal risk of injury, damage to equipment or fire and to prevent accidental loss by complying safety requirements.

1.2 Scope

This document shall be applicable to head office, workshop, manufacturing facilities, shutdowns and all the project sites and construction activities of SABQ Energy Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

MIG: Metal Inert Gas

Abrasive: An abrasive is a material, often a mineral, that is used to shape or finish a workpiece through rubbing which leads to part of the workpiece being worn away by friction.

Arc Eyes: A painful eye condition caused by damage/inflammation to the cornea from ultraviolet radiation during arc welding.

Burn: An injury caused by exposure to heat or flame. Burns damage the skin tissues.

Euphoria: A feeling or state of intense excitement and happiness that may be caused due to enrichment of oxygen.

Exposure: Any condition which provides an opportunity for an external environmental agent to enter the body.

Fire: A process in which substances combine chemically with oxygen from the air and typically give out bright light, heat, and smoke; combustion or burning. Fire is a combination of oxygen, heat and fuel.

Heat Stress: Heat stress is a situation where too much heat is absorbed by a person causing mental stress, illness or even death. Heat stress is manifested by elevated body temperature,

hot, dry skin, lack of sweating and neurological symptoms such as paralysis, headache vertigo and unconsciousness. It can also cause heat cramps, heat exhaustion and heat stroke which may lead to death.

Hydrocarbon Release: This includes a release with the potential for a fire or explosion sufficient to require preventative or evasive action.

Oxygen Deficiency:

Oxygen deficiency is defined as an atmosphere that contains less than the normal percentage of oxygen found in normal air. It occurs when inert gases such as nitrogen, helium or argon displace room air and thus lower the percentage of oxygen in the space below that is required for human life. OSHA defines an area as oxygen deficient if the percentage of oxygen is less than 19.5% by volume. As the human race becomes more deprived of the precious oxygen that it requires to maintain health, more serious health problems will surface.

Oxygen Enrichment: An atmosphere that contains more than the normal percentage of oxygen found in the air is called oxygen enriched atmosphere. OSHA defines an area as oxygen enriched if the percentage of oxygen is more than 23.5% by volume. Oxygen enrichment is hazardous and makes the environment flammable.

Welding: It is process of joining together metal parts by heating the surfaces to the point of melting with a blowpipe, electric arc, or other means.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Shall be responsible to ensure all the machine and hand tools for welding, cutting and grinding operation, used on the site have been inspected and are safe to use. Apply for necessary work permit.
- Shall be responsible to ensure that only inspected equipment/tools will be used at site.
- Shall be responsible to ensure that accidents related to cutting, grinding and welding are reported, investigated and that corrective and preventive measures are taken.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Representative

- Shall be responsible for identifying the construction activities that could lead to injury or property damage.
- Shall be responsible to ensure that JSA related to activities are properly conducted.
- Shall be responsible to monitor that all safe practices mentioned in this procedure for welding, cutting, and grinding jobs are implemented at site and PTW in place.

3.6 Job Supervisor

- Shall be responsible for ensuring that all operators are informed and shall follow procedures for the safe usage of hot working equipment within their areas of responsibility.
- Shall be responsible to conduct Risk Assessment along with In-Charge HSE.
- Shall be responsible to obtain PTW (Permit to Work) for hot work.
- Shall be responsible to ensure that all persons using hot working equipment are suitably trained and qualified.
- Shall be responsible to protect combustibles from ignition by any necessary safe means.

4.0 Procedure

4.1 Hazards in Cutting, Grinding & Welding

In general following hazards are involved in carrying out a job that involves hot working:

- Fire and explosion
- Fumes
- Electric shock
- Radiation
- Heat stress
- Noise and vibration

4.1.1 Welding Hazards and Risks

- Fire and explosion risks exist with both oxy-acetylene and arc welding, and many of the safety precautions already described are related to these hazards and must be taken at all times.
- Electric shock.
- Ultra-violet and infrared rays emitted during welding can cause skin irritation and burns similar to sun burning.
- Arc eye, which is a burn of the outer cell layers of the eye caused by ultra-violet rays.
- Infrared rays, which can damage the lens of the eye. This injury can occur when the eye is exposed to the rays emitted by molten metal.
- In the high temperature of welding, certain noxious fumes are formed.
- Nitric oxide formed from oxygen and nitrogen in the air is toxic, has a delayed action, and is difficult to detect as it is not irritating at the time of exposure.
- Ozone formed from oxygen. Is a highly toxic, irritant gas, has a distinctive smell and a delayed action. Ozone can also cause fire and explosion, as it is a very powerful oxidizing agent.
- Phosgene formed from degreasing agent, when welding is commenced before the surface is completely dry, is toxic and has a delayed action.

- Carbon monoxide formed when welding metals coated with tar, bitumen, paints and varnishes, or contaminated with oil. Also formed when carbon dioxide is used as an inert gas for shielded arc welding, is very toxic.
- While welding galvanized metal, alloys containing zinc, cadmium, mercury, antimony, chromium, tin, copper, or steel coated with any of these metals, fumes of toxic oxides can be formed. These fumes can cause a harmful action on the lining of the respiratory tract. Adequate ventilation of the working place can minimize or even exclude the danger from toxic gases. As a guide, the Occupational Safety and Health Administration (OSHA) requires that a minimum of 65 cubic meters (2000 cubic feet) of air be moved per minute for each welder in a room. If this cannot be arranged, breathing apparatus must be worn.
- Injuries caused by the scattering of hot particles of metals when welding, and using the correct protective clothes and equipment can prevent pieces of slag when a weld is being cleaned.

4.1.2 Grinding, Cutting Hazards and Risks

Bench-style and pedestal grinders create special safety problems due to the potential of the abrasive wheel shattering; exposed rotating wheel, flange, and spindle end; and a naturally occurring nip point that is created by the tool/work rest. This is in addition to such concerns as flying fragments, sparks, air contaminants, etc. Cutting, polishing, and wire buffing wheels can create many of the same hazards.

Grinding machines are powerful and are designed to operate at very high speeds. If a grinding wheel shatters while in use, the fragments can travel at more than 300 miles per hour. In addition, the wheels found on these machines (abrasive, polishing, wire, etc.) often rotate at several thousand rpms. The potential for serious injury from shooting fragments and the rotating wheel assemblies (including the flange, spindle end, and nut) is great. To ensure that grinding wheels are safely used in your workplace, know the hazards and how to control them.

4.2 Preparation for Work (Requirements)

A Work Permit shall be required and issued from HSE team prior to the start of a welding or cutting job, unless the work is to be done in an uninterested area or one specially designated for the purpose. For welding or cutting inside confined space, a Confined Space Entry Permit shall be obtained even if the work is being carried on inside a designated area.

The Work Permit shall specify all stand-by safety and fire-fighting equipment, which shall be available at the workplace before the start of work. Special precautions shall be taken regarding screening, scaffolding (ramps and toe boards), location of welding set, and the position, handling and use of gas cylinders.

Welders and burners shall be skilled tradesmen. Helpers will work under the supervision of a welder. COMPANY will issue Work Permits for all work after Ready for Start-Up.

4.2.1 Pre - Hot Work Check

A pre-hot work check shall be conducted by the responsible person prior to work to ensure that all equipment is safe and hazards are recognized and protected. The pre-hot work check shall be conducted at least once per day and recorded on **Annexure-A: Hot Work Checklist** of this SOP and shall verify the following:

- Fire Guard personnel are present.
- All persons performing hot work shall be trained.
- Portable fire extinguishers are operable and available.
- The hot work equipment is in good working order.
- The hot work area is clear of combustibles and flammable solids or that such materials present in the area at a distance of 35 feet.
- Exposed construction is of noncombustible materials or, if combustible, is protected.
- Openings are protected.
- Hot work area floors are clear of combustible waste accumulation.

4.3 Personnel Protective Equipment (PPE's)

Welder's protective clothing is designed to cover the body completely. This is necessary to protect the welder from burns, which can be caused by heat, ultra-violet and infrared radiation, sparks and scattering of hot particles.

The following precautions must be taken:

- Welders' overalls should not have any pockets, or 'turn ups' on the trousers, where sparks could be caught.
- Leather or other flame resistant aprons give additional protection against heat, sparks and flames and must always be worn while welding.
- Capes or shoulder covers made of leather or other flame resistant material must be worn when welding is to be done above head level.
- Eyes must be protected by well-fitting goggles, fitted with the correct filter glass. Welders and their assistants must use goggles even when wearing helmets and screens. The screens can then be lifted if necessary. Welding shields must be suitable for protection against molten metal and hot particles and conform to the requirements of BS EN 175: 1997 Personal protection: equipment for eye and face protection during welding and allied processes, or an equivalent specification. It must be used in conjunction with appropriate welding filter – BS EN 169 or EN 379). For detail please see **"Personnel Protective Equipment, HSE-SOP-023"**.
- A welder must always as a minimum use a helmet type protector, eye wear that has UV protection and hand shield type protector, which covers and protects his eyes and head.
- Hands must be protected by flame resistant gauntlets, which come high over the sleeve.
- Fire resistant leggings or high boots must be used for heavy work. For light work safety boots with reinforced toes must be worn.
- Fresh air line mask will provide protection from noxious fumes in all places where ventilation is poor. It must be used when working in confined spaces.
- Respiratory protection is needed when ventilation is not sufficient to remove fumes (such as in confined space) or when there is risk of oxygen deficiency.

PPE for Welding

4.4 Fire Prevention and Protection

- Fire Extinguishers shall be placed near all hot work activities.
- Transfer all combustible material in the area, to a safe location.
- If the combustible material cannot be moved, than screens shall be used to contain heat, sparks, and slag.
- While working above ground level, precautions shall be taken so that no combustible materials on the lower floor below will be exposed to sparks and flames.
- Fire watchers are required to have fire-extinguishing equipment readily available, and shall be trained in its use.
- A fire watch shall be maintained for at least 30 minutes after completion of hot work operation to detect and extinguish possible smoldering fires.
- Hot work is not permitted in areas with explosive atmospheres, or explosive atmospheres that may develop inside equipment which previously contained such materials.
- Hot work shall not be attempted on metal partition walls, ceilings, or floors that have combustible coverings.
- No hot work is to be performed on used drums, barrels, tanks, or other containers until they have been cleaned so thoroughly as to make certain that no flammable materials are present.

	PLACEMENT/ACCESSIBILITY OF EXTINGUISHER				
FIRE CLASSIFICATION	CLASS A	CLASS B	CLASS C	CLASS D	CLASS K
MAXIMUM TRAVEL DISTANCE TO FIRE EXTINGUISHER	75 FEET Maximum area that one extinguisher can protect and meet the 75 ft. rule = 11,250 sq. ft..	50 FEET Maximum area that one extinguisher can protect and meet the 50 ft. rule = 5,000 sq. ft..	In accordance with the Class A or B hazard it is protecting	75 FEET	30 FEET Maximum area that one extinguisher can protect and meet the 30 ft. rule = 1,800 sq. ft..

Travel Distances

4.5 Prevention of Injury

4.5.1 Eye Injuries

Eye injuries can occur as a result of exposure to radiant energy emitted during arc welding or when plasma or flame cutting operations are undertaken.

Prevention from this of injury can be achieved by the person carrying out the welding or cutting operation, wearing approved eye protection in the form of full face shield filter with the appropriate dark lenses for welding and approved dark goggles in the case of cutting. For personnel who are working within the area that may also be affected by the welding or cutting activities, welding screens will be erected around the welding or cutting activity to effectively shield, those working close by from flash burns to the eye. All such screens will be manufactured from a suitable non-reflective, fire retardant material and should be erected in such a manner as not to restrict ventilation of the working area. It should also be noted that all personnel will be required to wear, as a minimum for general site work, safety spectacles fitted with side shield. The wearing of this item of personal protective equipment will not provide protection from flash burns to the eyes. Damage to the eye can also occur from the ingress of hot slag, sparks or flying debris caused by chipping, cleaning-up or grinding of a weld. At all times while performing these activities, it shall be mandatory for additional eye protection to be worn, such as a full face shield.

4.5.2 Contact Lenses

The use of contact lenses is prohibited during welding and cutting operations. Any worker related to welding & cutting work depending on their trades shall be interviewed to check if they wear contact lenses during the medical examination before employment and they will be advised not to wear them during the operations.

4.5.3 Burns

Thermal: Burns of the skin from hot metal, spattered slag or metal, or from handling hot objects such as tools, rods or the work may be effectively prevented by the use of protective clothing such as arm and leg guards, aprons, shirts and gauntlets. Warning signs or barricades shall be considered to avoid injury to another worker such as burn injury by touching welded parts in a congested or busy traffic area after welding.

Radiant: Risk of burns from radiant energy to the unprotected skin of the welder (such as arms, neck, ears or face) is easily prevented by the wearing of protective clothing. The use of ultra-violet barrier creams may also be considered in certain situations.

Note: Clothing made from standard grades of nylon and other man-made fibers is not recommended for protection against thermal or radiant burns.

All personnel directly involved in welding and cutting shall wear suitable flame-resistant protective clothing, in addition to safety boots, helmets, etc. Such clothing shall include but not be limited to:

- Leather jackets
- Leather gauntlets / gloves
- Flame-proof or flame-retardant overalls.

4.5.4 Prevention of Electric Shock

- All portable welding machines and generators will be positively earthed by a 1meter earthing stake manufactured from suitable material (copper bonded ground rod) driven into the earth to a depth of at least 300mm.
- All welding earths will be connected as close as possible to the workplace or area where the welding is taking place.
- Welding earths shall not, under any circumstances be connected to any scaffolding, scaffold component or rigging equipment.
- Welding cables shall be kept dry and free from grease and oil to prevent breakdown of insulation.
- Cables with exposed bare conductors shall be replaced or discarded immediately.
- Welding cables shall, where practicable, be one continuous length. Should it be necessary to connect two or more cables, only purpose made, approved connectors shall be used for this purpose.
- All welding machines, welding cables, hand pieces, etc. shall be inspected by competent person (Color Coding Procedure) prior to being used in the Project site.
- All welding machine 240V power outlets shall be protected by a core balanced earth leakage protection circuit breaker set to trip at 30milliamperes.
- All welding and associated equipment will be inspected and tagged in accordance with the Equipment Inspection color coding procedure.

4.5.5 Toxic Fumes and Respiratory Protection

- Welding, cutting and brazing operations produce mixtures of gases, fumes and smoke of which the composition will depend on a number of factors such as base metal, welding temperature, type of electrode and flux, metal covering, contamination, shielding gases, etc.
- Other gases, fumes and smoke are produced from the burning of the base metal, welding rods, metal coatings, containments (e.g. solvents), fluxes, etc. The fumes consists mainly of iron oxide but oxides of zinc, manganese, nickel, antimony, copper, cadmium, etc., can be present, as well as fluorides.
- Metal surfaces may be coated with protective films of lead paint, zinc galvanizing, cadmium, oil or plastic. When these surfaces are heated other toxic fumes are generated.
- To ensure protection of the person carrying out the welding or cutting operation from inhalation of toxic fumes or vapors adequate exhaust ventilation shall be provided.
- In locations where adequate exhaust ventilation is not possible, welding can be carried out safely by personnel wearing suitable respiratory protection. Demand air supply or positive air supply types of equipment are recommended.

Dust or fume masks do not provide adequate protection.

NOTE: Welding or cutting in enclosed spaces such as tanks can seriously deplete the oxygen content of the air. Adequate ventilation is essential, supported by the welder wearing an air-supplied respirator when necessary.

4.5.6 Oxygen Enrichment

- Oxygen enrichment gives no warning; it is tasteless, odorless and colorless. It can bring on a feeling of Euphoria. An oxygen enriched situation can be easily catch fire; textile can burn fiercely without even noticing any signs of danger. Pressurized oxygen is not for blowing dust or cleaning clothing. Oxygen can saturate the material making 8 times more flammable.
- Oxygen/acetylene hoses and gauges shall be kept free of any oil or grease containments, especially at the threaded connection between hoses and gauges.

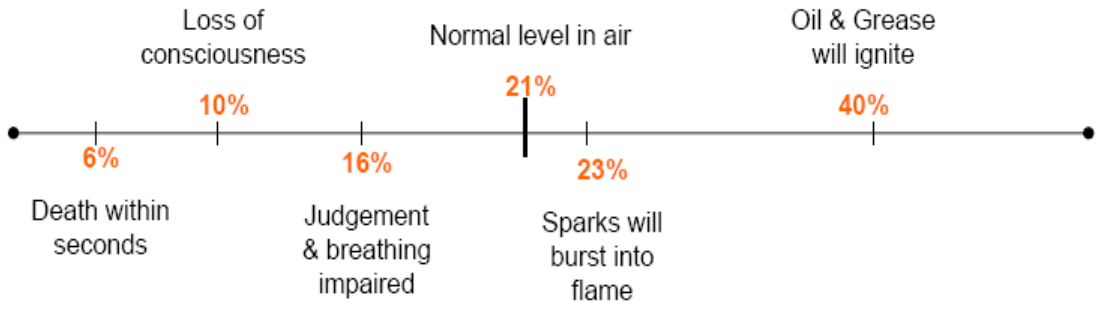


Fig: Oxygen Levels

4.5.7 Ventilation

Adequate ventilation shall be provided for all hot work operations to keep contaminants, fumes and gases in safe limits. For this, below mentioned strategies can be adopted;

- Natural Ventilation
- Mechanical Ventilation
- Fume Extraction Guns

4.6 Welding & Cutting

4.6.1 Oxy-Fuel Welding & Cutting

- Prior to the beginning of welding or cutting operations, workers must check that the cylinders regulators, backflow prevention device, flame arrestors, hoses, clamps, and torches are in good working condition.
- Oil or grease must not come into contact with oxygen cylinders, valves, regulators or other fittings. Do not handle oxygen cylinders or apparatus with oily hands or gloves, or greasy materials. Do not let oxygen contact oily or greasy surfaces or clothes, or enter a fuel oil or other storage tank.
- Fuel gas and oxidizers must pass through a pressure-reducing regulator prior to being used. Pressure reducing regulators must only be used at or below the rated pressures and must be specific to the type of gas being used. Prior to connecting a pressure regulator, cylinder valves should be "cracked" to clear the dust or dirt that might otherwise enter the regulator. This procedure shall be performed away from other welding work or sparks.
- Prior to removing a regulator from a cylinder, personnel must close all cylinder valves, and release the gas from the regulator.
- Personnel must follow the manufacturer's operating procedures for lighting the torch. Generally accepted practices for startup and shut down follow:

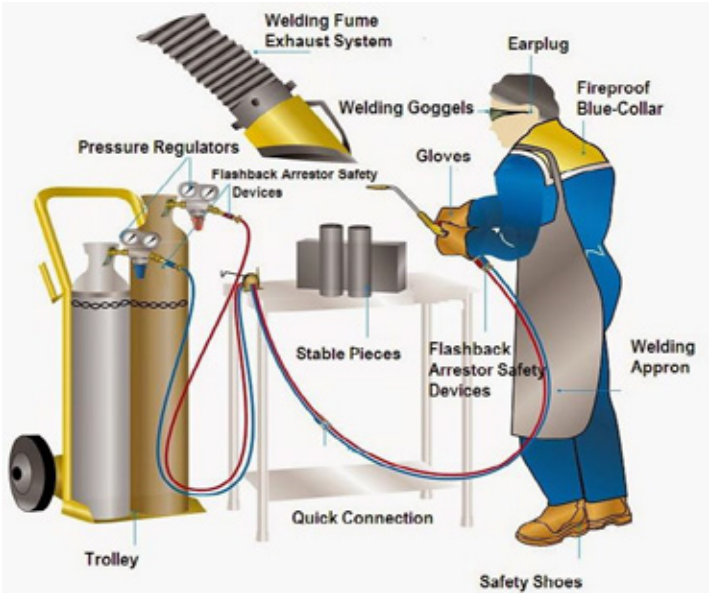
(a) Start Up

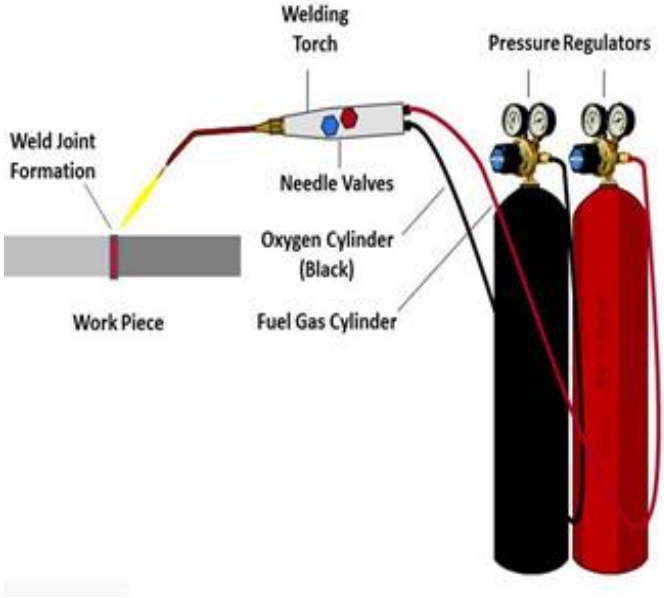
- Open the oxygen valve on the torch handle and adjust the oxygen regulator to the desired delivery range.
- Close the torch handle oxygen valve.
- Open the fuel valve on the torch handle and adjust the fuel regulator to the required delivery range.
- Close the torch fuel control valve.
- Hold the torch in one hand and the spark lighter in the other. Open the torch fuel valve approximately one-half turn and ignite the gas.
- Point the torch away from people and combustible materials.
- Keep opening the fuel valve until the flame stops smoking and bring the flame back to the tip.
- Open the torch oxygen valve until a bright neutral flame is reached.

(b) Shut Down

When shutting down the system, first shut off the oxygen, then the fuel gas. Drain the gas pressures from the system.

- Cylinders must be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, or fire-resistant shields must be provided.





Gas Welding

Care of Compressed Gas Cylinders

- Compressed gas cylinders shall be legibly marked identifying the contents.
- Compressed gas cylinders shall be stored and transported in the following manner:

  - Valve end must be up.
  - Outside storage areas must be protected from direct sunlight, external heat sources, electric arcs, or high temperatures.
  - Inside storage areas must be well-protected, well-ventilated, and in a dry location at least 20 feet from highly combustible materials.
  - Cylinders containing flammable gases will be stored at least 20 feet from oxygen cylinders.
  - Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards, or inside the cabs or passenger areas of vehicles.
  - Valve protection devices must be in place when cylinders are not in use, and during storage and transport. Valve protection devices **must not** be used for lifting cylinders.

  - Cylinders must be prevented from tipping, falling, or rolling.
  - All empty cylinders will be handled and stored as if they were still pressurized.

- If cylinders are found to have leaky valves or fittings which cannot be stopped by closing the valve, the cylinders shall be taken outdoors, away from sources of ignition, and slowly

emptied. Never put other workers at risk. If the leak is large, do not attempt to move the cylinder, evacuate all personnel from the area and notify your supervisor.

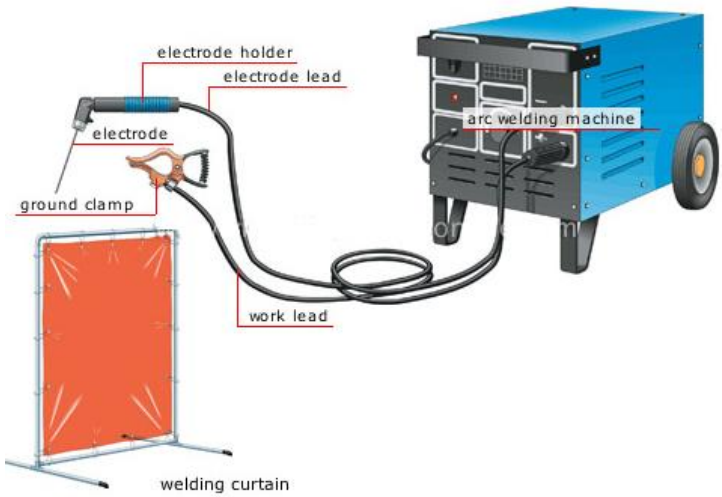
- Pressurized cylinders must not be taken into confined spaces.

4.6.2 Electric Arc Welding & Cutting

- Prior to beginning welding or cutting operations, workers must:

  - Check that the machine, all electrode holders and cable are capable of carrying the maximum current, are properly insulated and grounded, and have been maintained in good working condition.
  - Check that any cable splices have been performed with insulating quality equal to that of the cable, and that there are no splices within 10 feet of the electrode.
  - The area must be free of chlorinated solvent vapors within 50 feet of the exposed arc; surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is performed on them.

- When arc welding is performed in wet or high humidity conditions, personnel must use additional protection against electric shock (e.g., rubber pads or boots).
- To protect workers or other personnel from the arc rays, noncombustible or flameproof screens or shields shall be used, or personnel in the area shall wear appropriate goggles.
- Manual electrode holders must be specific to welding and cutting, and capable of handling the maximum current required for the operation. All current carrying parts gripped by the user must be insulated against the maximum voltage to ground.
- Arc welding and cutting cables must be insulated, flexible, and capable of handling the maximum current required by the operation, taking into account the duty cycles, and must not have bare or worn conductors. Cables must be free of repair or splice from 10' of the electrode holder unless insulated connectors or splices with insulating quality equal to that of the cable are provided. Exposed metal parts must be insulated.
- Ground return cables must have current carrying capacity equal to or exceeding the total maximum output capacities of the welding or cutting unit. Do not use electrical conduits or structures or pipelines containing gas or flammable liquids as part of the grounding circuit system.
- Arc welding and cutting machine frames must be grounded, either through a third wire in the cable containing the circuit conductor or through a separate wire at the source of the current. Grounding circuit resistance must be low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.
- When machines are not in use, the power supply switch shall be shut off and the electrodes removed and the holders placed to prevent employee injury.

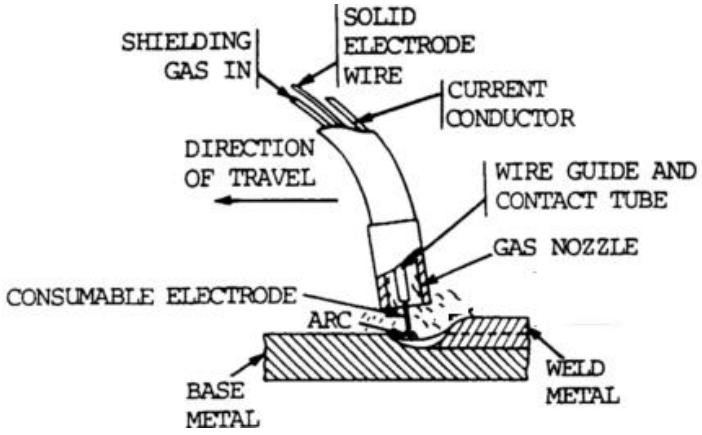


Arc Welding

4.6.3 Inert Gas Metal Arc Welding & Cutting

- When performing inert-gas metal-arc welding, extreme caution shall be used; inert gases can easily displace oxygen. The following safeguards must be followed.

  - The area must be free of chlorinated solvent vapors within 50 feet of exposed arc; surfaces prepared with chlorinated solvents shall be thoroughly dry before welding is performed on them.
  - Employees exposed to radiation must have their skin completely covered.
  - If welding on stainless steel, personnel must be protected by local exhaust ventilation or by wearing supplied-air respirators.



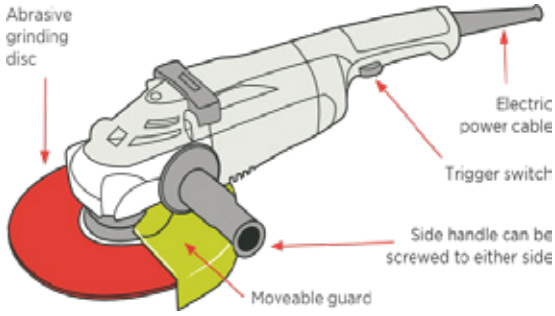
MIG: Metal Inert Gas Welding

4.7 Abrasive Cutting & Grinding

- Choose the right equipment (Cutter/Grinder) for the job.
- The guard must be securely attached to the power tool and positioned for maximum safety, so the least amount of disc is exposed towards the operator.
- The posture and positioning of the operator must be considered, while determining the appropriate tool for the job.
- Position the power cord clear of the spinning disc.
- Never lay the grinder/cutter down until the disc has come to a complete stop.
- Be sure the switch properly turns the equipment on and off. If not, do not use the tool until necessary repairs are made.
- Ensure that the equipment is unplugged before mounting or removing a disc.
- Read the instruction manual supplied with the grinder/cutter before use.
- Guards shall be securely attached to the body of the machine.
- Before mounting this shall be ensured that speed of the spindle does not exceed the max permissible speed marked on the disc.
- The outside diameter and the thickness of the disc must be within the capacity rating of your power tool.
- Do not use a damaged accessory. Before each use inspect the accessories such as abrasive wheels for chips and cracks, backing pad for cracks, tear or excess wear.
- If the power tool or accessory is dropped, inspect for damage or install an undamaged accessory.
- Discs must be used only for recommended applications. For example: Cutting discs should not be used for grinding jobs, and grinding discs should not be used for cutting jobs.
- Do not use worn down discs from larger power tools. A disc intended for a larger power tool is not suitable for the higher speed of a smaller tool and may burst.
- Allow the grinder to "run up" to operating speed before applying it to the job.
- Never bump the equipment on to the job, or let the disc hit any other object while grinding.
- Keep the machine disc at a 15 to 30 degree angle to the work.
- Make sure the work piece is held firmly.
- Wherever possible, adopt a comfortable stance, with feet apart and well balanced, and with a clear view of the job.
- When in cramped conditions, alternative tooling must be considered prior to using a grinder/cutter.
- Never use a grinder/cutter between the legs while sitting on the floor.
- Stop the machine at regular intervals for a short break to rest your hands and arms.
- Disconnect the power and place the grinder on a bench with the disc facing upwards when not in use.
- Do not run the power tool while carrying it at your side. Accidental contact with the spinning accessory could snag your clothing, pulling the accessory into your body.
- Regularly clean the power tool's air vents. The motor's fan will draw the dust inside the housing which may cause electrical hazards.
- Do not operate the power tool near flammable materials.
- Avoid over-tightening the locking nut, as this can exert hazardous forces on the disc.

- Kickback is the result of power tool misuse and/or incorrect operating procedures which can be avoided by taking proper precautions as given below:

  - Maintain a firm grip on the power tool and position the body and arm to allow you to resist kickback forces.
  - Always use auxiliary handle, if provided, for maximum control over kickback or torque reaction during start-up.
  - Never place hand near the rotating accessory. Accessory may kickback over hand.
  - Kickback will propel the tool in direction opposite to the wheel's movement at the point of snagging, so do not position the body in the area where power tool will move if kickback.
  - Use special care when working corners, sharp edges etc. Avoid bouncing and snagging the accessory. Corners, sharp edges or bouncing have a tendency to snag the rotating accessory and cause loss of control or kickback.
  - Do not attach a saw chain woodcarving blade or toothed saw blade. Such blades create frequent kickback and loss of control.



Abrasive Grinding Cutting

5.0 Training

All fabricators and welders shall undergo safety training for hot work that should include minimum of following topics:

- Risk and impact of fire on surrounding.
- Correct ways of holding hot work equipment.
- Mandatory PPE required for hot work.
- General HSE requirements related to their job.

Fire Watch Man shall have a separate training and recorded on the form. Training requirements for Fire Watch Man is given in HSE-SOP-011.

6.0 References

- Health & Safety Executive (UK)
- ISO 45001:2018 Occupational health & Safety
- OSHA, 29 CFR 1910.101, Compressed Gases
- OSHA, 29 CFR 1910.252, Welding Cutting and Brazing
- NIOSH Standards (National Institute of Occupational Safety & Health)
- SABQ – HSE Management System
- ADNOC – HSE Management System Guidelines

7.0 Attached Documents

- Annexure A: Hot Work Checklist

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

RIGGING AND LIFTING ACTIVITIES

Prepared and Issued by

SABQ Energy Contracting Group

REVISION INDEX HISTORY

SR. NO	REVISION	LOCATION OF CHANGE	DCR #	DATE OF RELEASE	DESCRIPTION
1	A	-	-	04-07-2024	Issued for initial review and comments

NOTE:

This page is record of all revisions for this document. All previous issues are hereby superseded and shall not be referred for any business requirements.

Table of Contents

1.0 Introduction

1.1 Purpose

This procedure aims to provide a guideline to ensure safe operation of all Crane and rigging activities at SABQ project sites and workshop.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of SABQ Energy Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

Anti-two Block Device: An anti-two-block system is used to prevent or warn the operator of a two-block condition on a crane. Two-blocking is the dangerous condition where the lower hook block is raised until it contacts any part of the boom tip hardware.

Anchor Point: These are the points on the body of a lifted load or a solid frame against which the load is being lifted. Anchoring hooks are attached to the anchoring point in order to lift the load.

Clearance Distance: When working near high voltage transmission powerlines, the minimum safe distance measured from the center line of the transmission powerline on each side of the powerline is called clearance distance.

Crane Radius: The horizontal distance between the centerline of rotation (boom) and the center of gravity of a suspended load.

Critical Lift: Any lift: utilizing multiple cranes; exceeding 75% of total capacity of the crane at lift radius; over an occupied structure or public street; greater than 20 tones or the load dimension exceeds 12 meters.

Lashing: Fastening devices made of chain or nylon webbing used to restrain load.

Lifting Equipment: All equipment used for lifting operations by an employee or contractor including, but not limited to, fixed lifting equipment, portable lifting equipment, other mechanical handling equipment, lifts and equipment used for carrying personnel. Examples are chain block, slings, crane, forklift truck etc.

Lifting Plan: A lifting plan is a document developed every time a heavy load is being lifted. The basic idea is to have control and establish safety precautions. It includes but not limited

to load calculation, crane position and movement, swing radius, weather condition, load dimension etc.
It is an important planning process that will identify all hazardous situations that might be encountered during lifting.

Load: A load is the item or items being lifted which could include a person, people, equipment or material etc.

Non-Critical Lift: Generally, these are lifts that are carried out on a regular basis that require no detailed engineering planning and which have been previously subject to a generic risk assessment. Lifting of all loads less than 10 ton is considered as non-critical lifts

Outriggers: Extendable or fixed members attached to the mounting base that rest on supports at the outer ends used to support the crane.

Signal Person: the signalman is part of the crane crew and is responsible to give signals to the operator for lifting, swinging, and lowering the loads. Not only does the signalman give signals for handling the load but he can also visually observe what operator cannot see from the operator's cabin.

SWL Capacity: Safe Working Load (SWL) sometimes stated as the Normal Working Load (NWL) is the mass or force that a piece of lifting equipment, lifting device or accessory can safely use to lift, suspend, or lower a mass without fear of breaking.

Tagline: A tagline is a rope attached to a load during a lifting operation to allow a rigger to control swinging and/or rotation of a suspended load.

Tandem Lift: A tandem lift involves the simultaneous use of two or more than two cranes, hoists or other pieces of powered lifting. In tandem lift, the center of gravity of the load changes during the lifting operation.

Winch Line Load Test: It is the process of putting a load demand on lifting device prior to the original lifting activity and measuring its response. Winch line and other components are inspected while the load is being lifted slight above the ground.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Reviews and approves procurement requisitions: carries out checks and inspections to ensure that delivered goods used for lifting and rigging activities are of good quality in respect of health and safety.
- Shall be responsible to ensure that crane and lifting related accidents are reported, investigated and that corrective and preventive measures are taken: joins the accident investigation team.
- Shall be responsible to ensure that the crane operation on the project site is carried out without endangering health and safety in accordance with the HSE plan and procedure.
- Shall be responsible to ensure that all employees receive PPE and sees to it that it is used where necessary and maintained correctly.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.

- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Lead

- Shall be responsible coordinate with the section managers to ensure that suitable arrangements, including subcontractors, are in place to conduct the crane operation and lifting activity safely.
- Shall be responsible to ensure that the crane, all lifting tools and tackles have current valid third party inspection certificates.
- Shall be responsible to ensure that the crane operator and riggers have necessary qualifications and third party certificates to carry out the lifting operation.
- Shall ensure that the necessary work permits and documents are in place for heavy and critical lifts.
- Shall be responsible to assign HSE officers for performing internal inspections, advising employees on subjects concerning health and safety.

3.6 Rigging Supervisor

- Shall be responsible to ensure that all personnel are; adequately trained for the relevant task; that they are using the correct equipment and personal protective equipment; that all relevant hazards have been identified; and that the respective permit to work formalities have been correctly addressed, where required.
- Shall be responsible to conduct a tool box talk meeting with his crews about the crane operation, related hazards and control measures to prevent any kind of injury.
- Shall be responsible in providing the required PPE to his crew for the job as mentioned herein this procedure.

3.7 Crane Operator

- Shall be responsible for correct operation of the crane in accordance with the manufacturer instructions.
- Shall be responsible that crane should be used on level ground or else set level on outriggers before any load is applied.

- Shall be responsible to get signal only from the Slinger/Rigger to carry out lifting of load.
- Shall be responsible for setting and checking the functioning of rated capacity.
- Shall be responsible to understand the climatic effect on the crane operation.
- Shall be responsible to take action in dangerous situation including stopping operation.

3.8 Rigger / Slinger

- Shall be responsible for attaching and detaching the load.
- Shall be responsible to direct initial movement of the crane.
- Shall be responsible to control the load completely at all time by tag line.
- Shall be responsible to balance loads, judge distances, heights and clearances.
- Shall be responsible for appropriate selection of rigging accessories.

4.0 Procedure

4.1 Crane Operation

- Contractor and/or subcontractors shall ensure that all cranes under its direct or indirect control are registered and certified and that all crane drivers and operators hold current valid certificates/licenses to operate a particular crane.
- Copies of current crane certification and crane operator certificates are to be kept by the contractor and be made available for audit purposes.
- SABQ reserve the right to test any crane operator for competence, familiarity with the operating manual requirements.
- Contractor shall advise SABQ of the arrival of any crane at the site, and will subject the particular crane to an inspection to be carried out by SABQ representative or its nominee. This inspection shall include a winch line load test at a weight which is equal to 100% of the rated winch line pull capacity. Any load test activities shall be arranged by contractor.
- All cranes, except tractor type cranes, shall be fitted with an anti-two-block device to both main and auxiliary hoist lines. Contractor shall ensure all such equipment is regularly maintained and calibrated so as to ensure its effective operation.
- It is contractor's responsibility to ensure that operators who operate any crane under its direct or indirect control are adequately trained and conversant in the following:

    - The safe operation of the machine.
    - Location and operation of all safety backup systems.
    - Reading and understanding of the load charts.
    - Capabilities of the machine in any unusual circumstances.
    - Any peculiarities pertaining to the machine.

- Contractor shall not allow crane operators to operate machines for which they are not trained; it is contractor's responsibility to ensure the operator receives adequate training in the safe operation of the relevant machine.

- Contractor and the SABQ HSE Department shall record details of operator training carried out to the satisfaction level. Details shall include acknowledgement from operator that he is satisfied with level of training provided.
- A person who slings or directs the movements of loads handled by a crane on the site is required to be a qualified rigger.
- It is forbidden for any person to ride upon any hook, load, and sling or hoist line or be transported around the site by crane.
- If outriggers are fitted, they shall always be used when lifting operations are being performed.
- Where cranes are to be left unattended for some time or at the end of each shift, they shall be parked in an "Out of Service" condition in accordance with the manufacturer's recommendations. Where the manufacturer's recommendations are not practicable, the following minimum site requirements shall be carried out.
- All mobile cranes (truck mounted or crawler) shall be temporary parked with the boom over the front end in the direction of travel. The boom should be lowered to an angle of approximately 50 degrees.
- The hoist rope (preferable main hoist) should be secured by the hook and slings, under tension, to the chassis of the crane or preferably to a suitable structure with slew brake locked on.
- The crane boom shall be orientated so that the boom does not project over or lie in the direction of items of operating plant.
- In the event of strong wind or a gale warning, all crane booms shall be laid down and adequately secured.
- Truck mounted cranes and all terrain cranes shall not under any circumstances lower their booms to the ground over the side of the machine. Should any boom be lowered to the ground it will be done over the rear of the machine

4.2 Lifting Operation

Rigging supervisor shall determine the lifting activity category as per following requirements:

4.2.1 Low Risk or Routine Lifting Activities

Low risk or routine lifting activities have following conditions:

- Valid for multiple and/or identical lifting operations.
- Any lifting activity that is less than 10 tones and within the crane manufacturer SWL capacity.

For routine and non-critical liftings **"Lifting Checklist (HSE-FRM-033)"** shall be used. For routine liftings rigging plan or study is not required, PTW is also not required.

4.2.2 Medium Risk Liftings

Medium risk lifting activities have following conditions:

- Any lifting greater than 10 ton and less than 20 ton.
- Any lifting where the crane is loaded over crane manufacturer SWL capacity.
- Liftings involving special attachments i.e. nonstandard lugs.
- Liftings made in areas where poor soil or unknown ground conditions exist.
- Liftings in congested areas where other structures, pipe racks, or other obstacles are nearby.

For medium risk liftings **"Medium/Heavy Lifting Checklist (HSE-FRM-036)"** shall be used. For medium liftings Permit to Work shall be required.

4.2.3 High Risk or Critical Liftings

High risk or critical lifting activities have following conditions:

- Any lifting greater than 20 tones.
- Any lifting in which load dimension exceeds 12 meters.
- Any lift in which operator is unable to watch the load.
- Any lifting that is required to be conducted in operational and live facility.
- Lifting involves lifting personnel, liftings over pipelines and near overhead electric power lines.
- Any lifting where safety of personnel and equipment's is at risk.
- Any lifting that required tandem lifting (use of two or more than one crane simultaneously).

For high risk or critical liftings **"Medium/Heavy Lifting Checklist (HSE-FRM-036)"** shall be used. For medium liftings Permit to Work shall be required. A written lifting plan/rigging study as per requirement of lifting checklist and PTW shall be required.

4.3 Hoisting of Material Using an Approved Material Basket

Only an approved material basket will be used at the worksite for the hoisting or lowering of materials or rubbish. Any items that will be hoisted shall be properly secured allowing no possibility of and objects falling whilst being hoisted. The immediate surrounding area shall be barricaded to avoid any unauthorized persons entering the area.

4.4 Rigging

4.4.1 General Requirements

- All persons employed by SABQ and Subcontractor to carry out rigging activities, shall be qualified with certification and will have to attend SABQ internal training on rigging and lifting activities.
- The SABQ HSE Department shall maintain a register of all qualified riggers.
- Only persons qualified as riggers shall directly supervise or be engaged in rigging work.
- A rigger shall act on the site without endangering his life or the life of other persons. Subcontractor shall ensure that all provisions of SABQ Safety Regulations, Client requirements and relevant Government Requirements pertinent to rigging work are complied with at all times.
- Lifting of plant and equipment shall be done in consultation with SABQ and Client. All lifts that falls in the category as Critical lifts such as a lift in excess of 20tons and all special and difficult lifts (e.g. high, long reach or 2 crane lifts) shall only be done after review of rigging study.
- Supervisor shall ensure that structural steel members solely designed for the support of cable trays are not used as anchor points for the use of chains blocks, snatch blocks, or anchorages for winches or any other lifting medium.
- All ropes, whether fiber or steel wire, shall be kept in good condition. Any rope showing indications of excessive wear, rust, splintering, high stranding, bird caging, broken strands/wires or any other defect shall be immediately discarded and destroyed. All rigging equipment will be supported by a valid test certificate.
- HSE shall maintain an on-going rigging register **"Inspection Checklist for Rigging Gears (HSE-FRM-035)"**, which confirms inspection of all rigging gear, carried out site HSE representative on a monthly basis. Only approved rigging equipment shall be used in the project. All rigging equipment will be color coded.
- All crane travel shall be with the normally mounted boom sections only. All hydraulic cranes shall have boom sections fully retracted, jibs removed or stowed and hook blocks secured. A positive lock device shall be engaged to prevent the boom from swinging during travel.
- All cranes working around populated or traffic areas shall have barricades placed to provide clearance for tail swing and only authorized personnel permitted inside. Lifts shall not be made over occupied parts of buildings. The load capacity of roof, floors, etc.; should be verified, to ensure an acceptable risk analysis, by a work proponent.
- It is the responsibility of users with full-time assigned cranes to install and reposition swing away jibs, and extensions on the hydraulic cranes. It is also the user's responsibility to reeve the hook block with the proper number of wire rope falls to accommodate the load to be lifted within the safe working limits of the crane.
- Suitable tag lines shall be used as appropriate to control suspended loads.
- The pinned extension of the hydraulic boom crane shall be extended prior to using a jib to obtain the maximum lifting capacity and radius.
- All cranes shall have their safe working load rating clearly visible in English and/or appropriate markings. All mobile crane operators shall perform a daily pre-start safety inspection, prior to operating his assigned crane.

- All mobile cranes shall be fitted with the following safety items: fire extinguisher (except when prohibited by User's regulations); seat belts; back-up alarm; spark arrestor. All mobile cranes working in Plants or other hydrocarbon areas shall be fitted with a Safe Load Indicator.
- Removable float-pads on cranes shall be removed and stowed prior to traveling the crane.

4.4.2 Rigging Gears

- **Slings**

There is a wide range of rigging and lifting slings for safely moving/lifting the loads. Selection of sling is based on intended use, size and type of load, and environmental conditions.

- Adjustable chain slings are used for handling odd-shaped, hard-to-position loads or hot material handling. Lift heavy concrete water and sewer pipes with teacup pipe lifting slings.
- Round slings are color-coded for quick identification of weight ratings.
- Wire/metal mesh slings are used in metalworking and other industries where loads can be abrasive, hot and tend to cut web slings.
- Wire rope slings are used for heavy-duty rigging and lifting applications.
- Web/synthetic slings provide stability and balance while lifting bulky objects.

Figure.1 : Types of Slings

➢ Shackles

A shackle is a U-shaped piece of metal secured with a pin or bolt across the opening, or a hinged metal loop secured with a quick-release locking pin mechanism. Shackles are the primary connecting link in all manner of rigging systems, as they allow different rigging subsets to be connected or disconnected quickly. Different types include D-shackle, bow shackle, threaded shackle etc.

Figure.2 : Types of Shackles

➢ Chain block/hoist

A Chain Block is a mechanism used to lift and lower heavy loads using a chain. When the chain is pulled, it winds around the wheels and begins to lift the item that is attached to the rope or chain via a hook. Every chain block has its capacity of lifting load.

Figure.3 : Types of Chain Blocks

- **Lifting Monorail**

Works on same mechanism as chain block does. It is usually attached with a load beam to adjust its position with reference to the load.

Figure.4 : Lifting Monorail

- **Spreader Bar**

Spreader bar (lifting spreader) is a very simple device, and consists of a long bar that function to hold a sling apart to the lifting distance. From a loading standpoint, they convert the lifting loads into compressive forces in the bar, and tensile forces in the slings. This results in a highly efficient use of material, which makes them lighter, easier to design.

Figure.5 : Spreader Bar

- **Lifting Beam:**

Lifting beam consist of a long beam that converts the lifting load into a bending moment through the beam. This is a much less efficient use of material, and as a result, lifting beams are in general heavier and more costly than spreader bars. The main benefit of lifting beams is that it substantially reduces headroom required to perform the lift

Figure.6 : Lifting Beam

- **Beam clamp**

Beam clamps are pieces of hardware used to suspend or secure fixtures, wires, bridal rings, threaded rod, electrical boxes and various hardware to beam flanges.

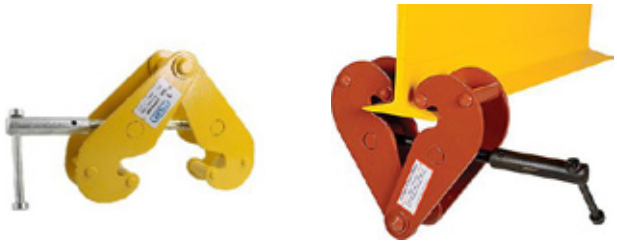


Figure.7 : Beam Clamp

- **Hooks**

A lifting hook is a device for grabbing and lifting loads by means of a device such as a hoist or crane. A lifting hook is usually equipped with a safety latch to prevent the disengagement of the lifting wire rope sling, chain or rope to which the load is attached.

Figure.8 : Lifting Hooks

4.4.3 Rigging Study / Lifting Plans

A Rigging study/Lift plan is a document that identifies a specific load and the operating restrictions. Pertinent information includes all weights of hook blocks and attachments.

The capacities plus wind speed, ground conditions and crane configuration shall be verified. Lift plan approval shall be by competent Rigging personnel designated by the work proponent.

The following items shall be addressed within an approved Rigging study/lift plan:

- Description of the load to be lifted specifying the weight in kilograms or tons.
- The total boom length requirement including details of any extensions or jibs that are to be used, stating type and length (jib lengths to be included in total boom length specified in meters).
- Identify the maximum operating radius required and specify in same length units as above.
- Determine and specify the high and low degree of boom angle operating limits.
- Identify the hoist to be used (main or auxiliary) and state wire rope size, construction and capacity.
- Determine the rigging equipment required to attach the load to the crane hook. Identify the item, quantity required, and describe the type, size, construction and state capacity. Include the specific hitch arrangement to be used and its capacity in kilograms or tons.
- Determine the total weight of all rigging devices, boom attachments (including extensions, jibs, hook block, headache ball, spreader bar, etc.) and state weight in kilograms or pounds. The above information is used to determine if the selected crane has adequate capacity to safely perform the lift as confirmed by the crane load chart.
- The Rigging study/Lift plan shall be signed by the originator and crane operator. It shall also be reviewed and approved by a Rigging competent person.
- A blanket lift plan may be used for repetitive lifts when there is no change in crane, load weight, location, obstructions, work environment or crane and rigging configurations.
- Determine that ground conditions are adequate or use additional floatation devices.
- A Rigging study/lift plan may be reused for critical lifts that are repeated, and where conditions remain unchanged. This applies to multiple use of the same blanket lift plan having the identical load configuration, using the same lifting equipment and accessories.

4.4.4 Inspection of Rigging Gears

Periodic inspection of all rigging gears must be carried out on monthly basis using “Inspection Checklist for Rigging Gears **(HSE-FRM-035)**” and use color coding as given in Table-1 below. All rigging gears shall be third party certified. All rigging gears shall be inspected before use, in case of any deformation observed by the user; shall be removed from the service and re-inspection shall be carried out.

Bi-Annually	Monthly	Color Code
1st	January to June	Blue Color
2nd	July to December	Green Color
For Rejected / Damaged Rigging Gears		Red Color

Table: 1

4.5 Contacts With Electrical Cables

Workers and equipment shall be kept at a minimum safe distance known as clearance distance while working near live electrical power line. Clearance distance with respect to voltage in power lines is shown in **Table: 2**.

In the event of contact with electrical cables (alive or dead), the following action should be taken:

- The Operator should:
  - Remain on the platform.
  - Keep still.
  - Not touch any part of the platform.
- Other personnel should:
  - Raise the Alarm.
  - Summon a Competent Electrical Person / Emergency Services.
  - Keep well clear and not touch any part of the equipment until the power has been confirmed as 'switched off'.

Voltage (kV) (Alternating Current)	Minimum Clearance Distance (Feet)
Up to 50	10
Over 50 to 200	15
Over 200 to 350	20
Over 350 to 500	25
Over 500 to 750	35
Over 750 to 1000	45
Over 1000	As established by the utility owner/operator or registered professional engineer who is qualified with respect to electrical power transmission.

Table: 2 Minimum Clearance Distances

4.6 General Safety Requirements During Lifting Activity

- Manufacturer's labels, e.g. operating instructions, hazard warnings, and rated load capacities, shall not be defaced.
- Job Safety Analysis (JSA) shall be done prior to lifting.
- Barricade the radius of the crane during lifting operation. No one is allowed to come under hanging load.

- Guards and other safety devices shall be in place and operable before any lifting device is used.
- People shall not stand, pass, or work directly under a suspended load.
- The operator shall always stop the engine(s) on any mobile crane before leaving it unattended.
- Wherever a lift could endanger personnel, a horn or similar warning device shall be sounded to warn personnel in the area that a lift is taking place.
- Any crane or mechanical equipment capable of having parts of its structure elevated near energized overhead electrical lines shall be operated so that a clearance of 20 feet is maintained or a Critical Lift Permit is required.
- While making lifts, cranes equipped with outriggers shall have them deployed according to the manufacturer's instructions.
- On truck-mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.
- Signal Persons shall be utilized in the following situations:

  - The Lift Operator cannot see the load.
  - The Lift Operator cannot see the path of travel of either the load or the crane.
  - The Lift Operator cannot see the load landing area.
  - The Lift Operator is too far from the load to judge distance accurately.
  - The lifting device is working within 20 feet of live power lines or equipment

- Signal Persons or Riggers shall control access to lift areas when lifts could endanger personnel. No one, except those directly involved with performing the lift, is permitted to enter the area without notifying and receiving acknowledgment from the Signal Person or Rigger.
- When Signal Persons are used with operators of lift devices other than cranes, the Lift Operator and Signal Person shall agree on the type of hand signals or verbal commands to be used. If a movement is to take place for which a signal or command has not been discussed prior to the operation, the lift shall stop and the appropriate signal or command shall be agreed upon before the lifting operations may resume.
- When traveling or rotating a crane with a load, a tag or restraint line shall be used if swinging of the load is hazardous, e.g. the load could contact another object or swing out beyond the radius at which it can be controlled. When used near electrical equipment, tag lines shall be a nonconductive type.
- When other mobile equipment is used for lifting, commercially available or built from an approved engineering design attachment devices shall be used.
- Free rigging is prohibited. If the lift equipment has the manufacturer approved lifting attachment installed on the tines/forks, it is not free rigging.
- Personnel-elevating work platforms shall not be used as cranes.
- In no case shall the lift exceed 90% of the charted capacity of the crane except when load testing a crane is conducted by or under the direction of a qualified third-party lifting equipment vendor, which does not require a critical lift permit.

4.7 Fall Protection

All personnel (riggers, scaffolds, painters, etc.) working aloft will be provided with and instructed to wear an approved full body safety harness. Please refer to **"Working at Height Procedure (HSE-SOP-012)"**.

4.8 Inspection of Cranes

Periodic inspection of all lifting equipment's cranes, forklifts etc. shall be inspected by maintenance department on monthly basis using **"Inspection Checklist for Lifting Equipment (HSE-FRM-034)"**.

5.0 Training

All personnel working with cranes, slings, or other lifting related devices shall be properly trained in accordance with this HSSE procedure.

6.0 References

- ISO 45001:2018 OHS
- Health and Safety Executive – UK
- SABQ HSE Management System
- Occupational Safety & Health Administration (OSHA) USA
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ILO Standards (International Labor Organization)
- ADNOC – HSE Management System Guidelines

7.0 Attached Documents

- HSE-FRM-033: Lifting Checklist (Under 10 Ton)
- HSE-FRM-034: Inspection Checklist For lifting Equipment
- HSE-FRM-035: Inspection checklist for Rigging Gears
- HSE-FRM-036: Medium/Heavy Lifting Checklist (10 Ton or above)

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

HEALTH AND HYGIENE MANAGEMENT

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

This procedure establishes the Health Management requirements for guidance and specifies the minimum requirements for ensuring a healthful work environment for all employees working either at offices and/or project sites.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of SABQ Energy Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

COSHH: Control of Substances Hazardous to Health.

MSDS: Material Safety Data Sheet.

Acute Effect: Acute effects describe the adverse effects of a substance that result either from a single exposure or from multiple exposures in a short period of time (usually less than 24 hours). To be described as acute effect, the adverse effects should occur within 14 days of the administration of the substance.

Cardiopulmonary Resuscitation: Cardiopulmonary Resuscitation (CPR) consists of mouth-to-mouth respiration and chest compression. CPR allows oxygenated blood to circulate to vital organs such as the brain and heart.

Chronic Effect: Adverse effect on body with symptoms that develop slowly, due to long and continuous exposure to low concentrations of a hazardous substance. Such symptoms do not usually subside when the exposure stops.

Disease Carrier: A person or organism infected with an infectious disease agent, but displays no symptoms.

Electrocution: The flow of electricity through a body is electrocution. The electron flow is what causes harm in tissue or nervous system damage, causing death or serious injury.

Effects from electrocution can include burns or interference to our body's electric signals. A small current can actually kill you by entering the body, going through the heart, and exiting through the other side.

First Aid: First aid is the assistance given to any person suffering a sudden illness or injury, with care provided to preserve life, prevent the condition from worsening, or to promote recovery.

Heat Stroke: A condition marked by fever and often by unconsciousness, caused by failure of the body's temperature-regulating mechanism when exposed to excessively high temperatures.

Passive Smoking: The involuntary inhaling of smoke from other people's cigarettes, cigars, or pipes.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Shall be responsible to ensure that the Site and the temporary facilities in a healthful work environment.

- Shall be responsible to provide all necessary support including selection and recruiting of suitable staff, services and necessary materials required by the medical team at site.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Representative

- Shall be responsible for the preparation of the Health Procedure in coordination with the clients HSE Representative and local authorities, to establish the Health requirements of the company and sub-contractor personnel.
- Shall be responsible for the implementation and management of the Health Procedure at the Site.

3.6 Doctor / Nurse / Paramedic

- Shall be responsible for providing first aid, conducting medical examinations and inspections.
- Shall be responsible for speedy evacuation of sick / injured personnel to outside medical facility, when required.
- Shall be responsible for monitoring the facilities, identifying non-conformances and recommending improvements.

4.0 Procedure

The health of all personnel at all working premises (head office, workshop, project sites etc.) shall be protected from adverse health effects that may result from operations and products by:

- Identifying and managing health risks.
- Communicating health risks and prevention measures to all personnel.
- Training the personnel in project specific health aspects.
- Ensuring that the site staff is physically fit for the work.
- Preventing the workers from being exposed to conditions adverse to their health.
- Preparing and implementing a comprehensive sanitation and waste management procedure for the site.

4.1 Assignment of Personnel and Workers

4.1.1 General

Employees engaged in physical labor should not exceed the age of 60 years. Office employees should not exceed 65 years. Child labor is not allowed at any project site or any other working domain of EEPL.

All site personnel and workers shall be medically examined to ensure that they are in good health and fit for the work before they are mobilized at the site. Contractor shall appoint paramedic or provide medical records, preferably with knowledge of the working environment. A medical examination register shall be kept at project site.

4.1.2 Medical Examination

A Certificate of Fitness shall be issued to each worker. The medical examination shall be the responsibility of each subcontractor for his personnel and of contractor. Contractor and Subcontractor shall provide the Certificates of Fitness of their employees. The overall responsibility will be that of contractor.

Workers fitness shall be assessed for the type of work to be assigned and certified by the Doctor after prolonged absence from work due to sickness or injury.

SABQ shall also maintain medical fitness record of its employees at all times and medical records should be revalidated on annual basis.

4.1.3 Food Handlers and Cleaning Personnel

Everyone working in food handling areas and living quarters shall maintain a high degree of personal cleanliness and wear suitable, clean and protective clothing.

No one who is a carrier of a disease transmittable through food, or whilst afflicted with infections, sores and the like, shall work in food handling areas or living quarters.

All food handler personnel shall be supervised, instructed and trained in food hygiene.
In addition to pre-employment medical examination, food handlers and cleaning personnel shall be medically examined and certified annually.

4.2 Alcohol and Drugs

Alcohol will not be allowed at the site or offices. Illegal drugs will not be tolerated in any of the project locations.

Employees and workers are required to be free from illegal drugs and have the responsibility not to be impaired by alcohol while working. Any manager or supervisor has the authority and the responsibility to take appropriate action if they believe a person on the project/offices premises is impaired by alcohol or drugs.

SABQ alcohol and drug policy shall be explained to all personnel at the time of employment and at the Site HSE Induction Training.

4.3 Health Training

4.3.1 First Aid Training

Personnel selected from the workforce, one for every 50 people and mainly supervisory staff, shall be trained in First Aid in order to support the medical personnel in case of multiple injuries or simultaneous accidents in different places of work. During shift working at project sites it shall be ensured that appropriate paramedic or trained First Aider is always present.

These personnel shall receive basic training in first aid at the work site, in particular for electrocution, burns, heat stroke, bleeding and CPR. Certified medical personnel shall conduct the training.

Further, the personnel shall receive basic information related to first aid assistance, survival procedures, "do's" and "don'ts" in case of accidents, and information related to the main health hazards of the area. Refresher first aid courses shall be carried out at regular intervals at the work site.

4.3.2 Hazardous Substances Training

As part of the HSE training, all employees/workers shall be informed of the hazards they are likely to encounter when working with hazardous substances. The training shall cover the following:

- Use of appropriate PPE.
- Hazardous materials that will be used at the Site.

- Material Safety Data Sheet (MSDS) and their content.
- Exposure to, and handling of, hazardous substances.
- Storing and container labeling.
- Hazardous waste collection and disposal.
- Provision of "Safety shower and eye wash" near areas handling hazardous materials.

As part of the Job Safety Analysis, after the identification of hazardous substances that may be used, the workers shall be trained, using the relevant MSDS, in the use and handling of these hazardous substances, including the use of proper tools and PPE for handling the materials and first aid techniques in case of exposure or ingestion. For detail please see **"Control of Substances Hazardous to Health, HSE-SOP-005"**.

4.3.3 Heat / Cold Stress

Heat stress / Cold stress awareness training shall be provided as part of the HSE induction training as well as separate more comprehensive site based training packages. The heat index will be monitored from March through to October, although the hottest moths are during summer which is from May to September. All workers should be facilitated with small interval breaks on regular basis during extreme hot conditions.

4.3.4 Tropical Disease Mitigation

The medical personnel shall conduct education courses on the prevention, prophylaxis, and diagnosis and treatment.

4.3.5 First Aid Procedure Training

As part of the HSE training, the workers shall be informed and become familiar with the procedure for reporting and requesting the intervention of first aiders and medical personnel.

4.3.6 Training Records

Records of the training, specifying names of the trainees, the name of course, the date, and the name of the instructor, shall be kept and filed by the HSE Department. Training records shall be recorded on **"HSE Training Records, HSE-FRM-008"**.

4.4 Health Hazards Identification

Major health hazards identified and prevention and mitigation measures are listed in **"Health Hazards Identification - Annexure A"**.

Assessment and evaluation process shall ensure compliance with all aspects of the occupational health and that lessons learnt are incorporated in the specific plans, procedures and method statements. "LESSON LEARNT" register shall be maintained.

4.5 Housekeeping and the Environment

4.5.1 General

The project sites, offices, work areas and the Temporary Facilities shall be maintained to a high standard of housekeeping at all times in order to;

- Secure clear access.
- Eliminate potential sources of fire.
- Maintain a safe and healthful work environment.
- Smoking shall be allowed only in designated areas to prevent "Passive Smoking" by non-smokers.

All supervisors, including the Subcontractors, shall conduct daily inspections. In addition, periodic inspections by the Safety Committee shall be conducted and reports maintained.

4.5.2 Portable Water and Sanitation

SABQ shall provide an adequate supply of potable water and sanitary facilities for the workforce at project sites, offices and workshop. Locations will vary, depending on the progress of the work. Drinking water shall be provided in sealed containers. Disposable or individual cups shall be used. Common cups shall not be permitted.

Toilets shall be located at designated areas only. All toilet facilities shall be cleaned and disposal services for the toilets provided on a continuous basis. One toilet shall be provided for each 30 workers and located within a reasonable distance to each work area. Hand soap or other cleaning agents and individual paper hand towels shall be provided.

4.5.3 Air

Exhaust fans shall be used when working indoor or enclosed space.

4.5.4 Noise

As far as practical, low noise/silenced construction equipment shall be used. Where noise at work areas exceeds 85 db, barriers and warning signs specifying the use (mandatory) of ear protectors shall be installed. Necessary heating protectors shall be provided to personnel expected to work in noisy area.

4.5.5 Vibration

Many workers do not think that their exposure to vibration could be a health hazard. Vibration exposure is more than just a nuisance. Constant exposure to vibration has been known to cause serious health problems such as back pain, carpal tunnel syndrome, and vascular disorders. Vibration related injury is especially prevalent in occupations that require outdoor work, such as forestry, farming, transportation, shipping, and construction. There

are two classifications for vibration exposure: whole-body vibration and hand and arm vibration. These two types of vibration have different sources, affect different areas of the body, and produce different symptoms.

Whole-body vibration is vibration transmitted to the entire body via the seat or the feet, or both, often through driving or riding in motor vehicles (including fork trucks and off-road vehicles) or through standing on vibrating floors (e.g., near power presses in a stamping plant or near shakeout equipment in a foundry).

Hand and arm vibration, on the other hand, is limited to the hands and arms and usually results from the use of power hand tools (e.g., screwdrivers, nut runners, grinders, jackhammers, and chippers) and from vehicle controls. For detail please see **"Machine, Power and Hand Tools, HSE-SOP-020"**.

Vibration caused from equipment's that are not placed correctly or tied down may also cause vibration, this type of vibration may cause mental stress like e.g. being tortured day in and day out causing employee to become irrational and agitated during the day leading to conflict in the work place. This is sometimes caused by air conditioners, fridges, large kettles boiling water or even large generators outside of the offices emitting a drone, (deep humming sound).

4.5.6 Hazardous Material and Substances

Hazardous materials shall be stored on impermeable pads with full containment.

Paints, solvents and other hazardous materials shall be stored in shaded, dry, well-ventilated areas located away from offices, workshops and hot work areas. Storage shall be done in accordance with the MSDS and the vendor recommendations.

Up-to-date MSDS shall be available at Site for all hazardous chemicals and substances brought to the Site. The MSDS shall be provided by the suppliers of such hazardous chemicals and substances and filed by the site warehouse representative. A binder containing all the MSDS's related to chemicals on site will kept in both the HSE Department and Materials warehouse where the chemicals are stored.

4.5.7 Radioactive Materials

Radioactive materials that decay spontaneously produce ionizing radiation, which has sufficient energy to strip away electrons from atoms (creating two charged ions) or to break some chemical bonds. Any living tissue in the human body can be damaged by ionizing radiation in a unique manner. The body attempts to repair the damage, but sometimes the damage is of a nature that cannot be repaired or it is too severe or widespread to be repaired. Also mistakes made in the natural repair process can lead to cancerous cells. The most common forms of ionizing radiation are alpha and beta particles, or gamma and X-rays.

In general, the amount and duration of radiation exposure affects the severity or type of health effect. There are two broad categories of health effects: **stochastic** and **non-stochastic.**

Stochastic effects are associated with long-term, low-level (chronic) exposure to radiation. ("Stochastic" refers to the likelihood that something will happen.) Increased levels of exposure make these health effects more likely to occur, but do not influence the type or severity of the effect.

Non-stochastic effects appear in cases of exposure to high levels of radiation, and become more severe as the exposure increases. Short-term, high-level exposure is referred to as 'acute' exposure.

Many non-cancerous health effects of radiation are non-stochastic. Unlike cancer, health effects from 'acute' exposure to radiation usually appear quickly. Acute health effects include burns and radiation sickness. Radiation sickness is also called 'radiation poisoning.' It can cause premature aging or even death. If the dose is fatal, death usually occurs within two months. The symptoms of radiation sickness include: nausea, weakness, hair loss, skin burns or diminished organ function.

Storage and Control of Radioactive Isotopes

- The radiography vendor is responsible for providing, controlling and maintaining a secure radioactive storage.
- The isotope storage area shall be located in a non-working area on the site and away from any vehicular or pedestrian traffic, but close enough to the road to avoid transportation over long distances.
- The storage shall be walled and roofed for, protection against rain and mist.
- The storage areas shall be enclosed with a 2 meter high chain link fence and each of the four communal fenced sides shall display the radioactive warning pictogram.
- The HSE group shall control the keys of the storage area fence, the storage itself and storage pits.
- It shall be so located that the resultant radiation exposure rate in any occupied area is as low as practical, particular care being taken that no person may be exposed to doses of radiation in excess of the dose limitations given by relevant statutory requirements.

Portable Fire extinguisher of dry chemical powder 9kg type should be installed on premises of hazardous substances.

A Fire Fighting crew will be organized by SABQ and will be trained at frequent and regular basis. All Project personnel will be briefed on fire extinguishers and other equipment use and reporting procedures during the new employee orientation and at frequent tool box safety meetings. Hands on training are invaluable for those expected to use fire extinguishers. Emergency procedures and telephone numbers will be posted at key locations.

4.6 Site Accommodation Facilities

4.6.1 General

The site accommodation shall be located in a well-drained location and the facilities shall be well lit, ventilated and easy to be clean.

4.6.2 Kitchen

Kitchen and messing areas shall be completely separated from the accommodation areas. The floors shall be graded to flow into suitably located floor traps for ease of washing. Rodent proof food stores shall be provided. Only bottled gas and electrical stoves are acceptable. If bottle gas is used, location of the bottles shall be in conformance with the Handling of Gas Cylinders Procedure. Kitchen areas shall be cleaned daily, immediately after meals have been served.

4.6.3 Living Quarters

Living quarters shall be in good condition. No food storing or preparation shall be allowed in the living quarters. Living quarters shall be cleaned daily. The areas around the building shall be cleaned at all times.

4.6.4 Pest Control

The accommodation area shall be fogged every week or as required depending on the project location for control of flies and other insects. Do not use any form of residual pesticide, only use aerosol/flushing agents which are properly labelled or follow the instructions of manufacturers. It is the responsibility of all the personnel to report to the Pest Control Unit in case of any pest infestation.

4.6.5 Garbage Disposal

The accommodation area is to be kept free from litter and waste at all times. Adequate garbage receptacles shall be provided and emptied daily.

4.7 Environment and Waste Management

Waste identification, classification, handling and disposal shall be covered by a specific plan (Waste Management Procedure) prepared based on the criteria specified in Waste Management Program and Environmental Management System developed based on ISO 14001.

Waste management and the protection of the environment shall be explained to all personnel during HSE Induction Training.

4.8 Medical and First Aid

4.8.1 Medical Assistance

Qualified medical personnel shall be appointed in order to give first aid and emergency medical care to injured workers. In addition, personnel assigned from among the workforce, mainly supervisory staff, shall be trained in first aid and holding First Aid Certificates at the ratio of one to every 50 personnel.

A first aid medical care facility with adequate medical equipment shall be installed at SABQ workplaces including offices. The first aid rooms shall include facilities for an employee/worker to lie down for treatment and be furnished with a large industrial size first-aid box.

A log of all first aid treatments shall be maintained. The log shall record the name of the treated person, date, time, nature of injury and treatment. All injuries, regardless of their seriousness, shall be immediately reported to SABQHSE Department.

4.8.2 First Aid Kits

First Aid Kits shall be located at the site so as to allow easy and quick access. The area supervisor shall be responsible for ensuring that the kit is maintained in serviceable conditions. The Paramedic shall specify the basic content of each kit. All items that are required to be sterile shall be individually wrapped and sealed.

4.8.3 First Aid Procedure

General

Only Trained First Aiders shall be conversant with the procedure and should be applied when they, or a co-worker working in their area, sustained injury.

Minor Injuries

The injured person shall verbally report to his immediate supervisor the accident causing the injury and seek immediate treatment either by the medical staff or first-aider in charge of a first-aid box within a working area.

The paramedic shall then enter the details of the accident on behalf of the injured person in the form for recording first-aid treatments.

The immediate supervisor shall also be kept fully informed of the situation. The supervisor, after notifying the HSE Section of the accident, shall investigate, together with the safety representative, and prepare the accident report, thus ensuring that prompt remedial action is taken to prevent a recurrence.

Serious Injuries

Supervisor, foreman or other persons at the location shall make sure the injured are getting first aid and shall immediately call the ambulance. Unless the injured person is in danger of further injury, such as caving in ditch or falling objects, he shall not be moved until the arrival of the doctor or nurse.

Site HSE representative, Supervisor, foreman or other persons shall immediately notify the HSE Manager and the Project Manager.

4.9 Control and Inspection

The HSE Representative together with the Administration Representative and Paramedic Personnel will be responsible for the control and inspections of the hygiene of the permanent/temporary facilities at offices and project sites.

The supervisors will be responsible for the daily inspections of their working areas to ensure that they are clean and garbage and waste are removed.

In addition to HSE audits and HSE Committee inspections, the following inspections and controls shall be carried out.

- At weekly intervals the HSE/Admin staff shall inspect the site facilities and offices, in particular showers and toilets, kitchen and canteen.
- HSE Manager shall designate competent persons to quarterly inspect vehicles for personnel transportation cleanliness and certify.
- Water samples will be analyzed on regular basis.
- Audiometric testing of working areas are carried out by the HSE Representative monthly at locations in and around areas identified as areas where the noise equals or exceeds 85 dB(A).

Health and Hygiene Inspection shall be carried out on monthly basis at head office, project sites, workshop etc. in accordance with **"Health and Hygiene Inspection Checklist, HSE-FRM-046"**.

4.10 Records and Reporting

Following records shall be maintained:

- MSDS for all hazardous materials handled at site.
- Employment physical examination.
- Training records.
- Individual employee record of injury or illness.
- Examination results of food handlers and cleaning personnel.
- Inspection and audit reports.
- Pest control measures.

5.0 Training

All the workers shall be provided with awareness training on health and hygiene. This awareness training shall at least cover the following topics:

- Health and Hygiene Standards.
- Chemical and physical contamination at job location.
- Food safety precautions.
- Vaccinations.
- How infectious disease spread?
- Using toilet facilities in field

6.0 References

- Health & Safety Executive (UK)
- OSHA, 3143, Industrial Hygiene Guideline
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ADNOC – HSE Management System Guidelines

7.0 Attached Documents

- Annexure A: Health Hazard Identification
- HSE-FRM-046: Health and Hygiene Checklist

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

ENVIRONMENTAL MONITORING & CONTROL

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

This procedure establishes requirements in order to ensure and managing environment for the protection of air, land and any body of water. The procedure shall also describe the environmental issues, risks and mitigation procedures associated with the construction activities and environmental programs in place to address these issues. The Procedure shall comply with the applicable laws, decrees, administrative rules & regulations, relevant COMPANY policies, standard operation procedures, and international safe work practices.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of SABQ Energy Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

dB: Decibel

EIA: Environmental Impact Assessment

EMS: Environmental Management System

EPA: Environmental Protection Agency

Corrosive: Substance that cause visible discoloration, destruction or irreversible changes in the material at the point of contact.

Emission: Any release of pollutant(s) into the environment, be it of an **effluent,** gaseous, liquid, or solid nature, or a combination thereof.

- A discharge into the atmosphere.
- A discharge of liquid.
- Any other type of discharge, for example disposal.

Exhaust Fumes: Gases ejected from an engine as waste products. Vehicle exhaust fumes can irritate the eyes and respiratory tract, and are a risk to health by breathing in. Carbon-fueled engine fumes contain carbon monoxide, a poisonous gas. Prolonged exposure to diesel fumes, especially blue or black smoke, may lead to coughing and breathlessness.

Flora & Fauna: Flora is the plant life occurring in a particular region or time, generally the naturally occurring or indigenous—native plant life. The corresponding term for animal life is fauna.

Hazardous Waste: Waste may be defined as hazardous on the basis of waste characteristics e.g. flammability, ignitable, toxic, mutagenic, reactive, corrosive etc.

Neutralization: A neutralization reaction is when an acid and a base react to form water and a salt and involves the combination of H^+ ions and OH^- ions to generate water. The neutralization of a strong acid and strong base has a pH equal to 7.

Ozone Depletion: Ozone layer depletion, is the wearing out (reduction) of the amount of ozone in the stratosphere. Ozone layer depletion increases the amount of Ultra Violet rays that reaches the Earth's surface.

Soil Erosion: Soil erosion is defined as the wearing away of topsoil. Topsoil is the top layer of soil and is the most fertile because it contains the most organic, nutrient-rich materials. One of the main causes of soil erosion is water erosion, which is the loss of topsoil due to water.

Spontaneous Combustion: The ignition of organic matter (e.g. hay or coal) without apparent cause, typically through heat generated internally by rapid oxidation.

Total Dissolved Solid: Total dissolved solid (TDS) is a measure of the dissolved combined content of all inorganic and organic substances present in a liquid in molecular, ionized or micro-granular (colloidal sol) suspended form.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all business areas, activities, projects, and workshop.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's operations are executed at all times in such a manner as to ensure, so far as reasonably practicable, the health, safety and welfare of all employees and others who may be affected by its operations.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of details given in this procedure.
- Shall be responsible to allow the personnel to attend the necessary training without compromising HSE critical activities.
- Shall be responsible to ensure the implementation of Environmental Management System ISO 14001:2015 and Organizational internal policies on Environmental Management.
- Shall be responsible to ensure that accidents related to environment/spillages are reported, investigated and that corrective and preventive measures are taken.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for implementing Environmental Management Procedure that will minimize the effect and impact of the construction activities in the surroundings , achieve the reduction of waste generated, recycling of waste in the project.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 Site HSE Representative

- Shall be responsible to ensure the site implementation of the environment management system.
- Shall be responsible for inspections to make sure that all facilities are in place to avoid environmental incident. Whenever there is any environmental incident, he will determine the appropriate action particular to the event.

- Shall be responsible for coordinating with the site construction supervisor in proper disposal of the waste generated during the course of their activities.
- Shall be responsible for daily inspection of storage and critical activities, which may cause hazardous substances accidental release or spill into the environment; with a view of safeguarding the environment and the installed facilities.
- Shall be responsible to monitor the gas emissions from the smoke producing equipment and the sound level in any area where the noise level is high. He will carry out his activities through inspections and reporting on daily basis.

3.6 Job Supervisor

- Shall be responsible in maintaining a healthy environment in their jurisdiction. It shall be in conformance to an appropriate standard to prevent any environment incident.
- Shall be responsible to ensure when there is a release of any kind in their areas, they are expected to coordinate the containment and clean up exercise and to arrange for immediate disposal of all associated wastes.
- Shall be responsible to make sure that his subordinates clearly understood and abiding the environmental site regulations.
- Shall be responsible to ensure proper waste segregation in his area of responsibility.

4.0 Procedure

This Environmental Monitoring Procedure has been developed with the intention of fulfilling the requirements of the national legislations of the region, company set standards and EPA/EIA reports.

The primary purpose of this Environmental Monitoring Procedure is to protect the Valued Environmental Components identified during the operation activities i.e. land / atmospheric Resources, Flora, Fauna, Water and to identify predicted and unanticipated changes to the physical, biological and social environment brought about by the activities during the Construction Phase.

Components to be monitored during the Construction Phase include:

- Atmospheric Emissions (Dust, Exhaust, Noise and Radiation).
- Water Resources (Groundwater and Sewage Discharge).
- Waste (Classes and Volume).
- Chemicals.
- Flora, Fauna and Topsoil.

Projects Planning and Execution will ensure that this Environmental Monitoring Procedure is thoroughly communicated to relevant personnel during all phases of the Project, and that this procedure is strictly observed and complied by its Subcontractors, to ensure compliance with applicable Laws, Legislation, Regulations and Guidelines set by the company.

4.1 Environmental Policy

- SABQ recognizes that the Earth environment is essential and will comply with the following Environmental policy for planning and conducting the construction business for human survival not only for present but also for future generation.
- SABQ shall establish and observe the Environmental Management System (EMS) based on the ISO 14001:2015.
- SABQ shall comply with the environmental legislation, regulation and other requirements, and reflect and collect the public opinions from environmental groups and interested parties.
- SABQ shall identify the environmental aspects of all factors derived from the process of construction project on planning, designing, construction and servicing, etc., and shall actively perform an Environmental Impact Assessment, environmental prevention and eradication of pollution.
- SABQ shall set environmental objectives as below and do continual improvement in order to accomplish the environmental policy.

  - SABQ shall minimize the construction wastes, and then establish the target of disposal cost for wastes proportional to sales amount and achieve it.
  - SABQ shall minimize the source of pollution by establishing target of saving energy and resources and implementing it.
  - SABQ shall strive that there is no environmental accidents and violation of environmental legislation and regulation.
  - SABQ will audit and monitor waste disposal and recycling. Sub-contractors to ensure compliance with all Environmental regulations.

  This environmental policy shall be open to the public. Every employee of SABQ and subcontractor should understand and comply with the policy, and shall actively participate in and make utmost efforts to the environmental management activity.

4.2 Site Environmental Control

4.2.1 Dust Pollution

SABQ shall adequately spray the area with water especially the road under construction to prevent or minimize dust. Water spraying construction areas shall be done twice a day, morning and afternoon on a regular basis. Dust will also be generated from the following activities/elements.

- Construction road development.
- Excavations and trenching activities.
- Sand stock piling.
- Separation of different grades of rock or earth material.
- Structural works such as grinding, drilling, sandblasting etc.
- Weather elements such as high wind levels, dust storms, heat and humidity levels etc.

SABQ will ensure that all site workers are well equipped with suitable PPE to counter some of these effects. Certain working areas will have a canvas form of sheltering for protection against elements. The site conditions will be monitored by the HSE Supervisor. He will inform the HSE Site Lead of the conditions on site at all times. The SABQ HSE Site Lead will assess the situation and act accordingly.

4.2.2 Body of Water & Drinking Water

SABQ shall protect all forms of body of water around the site that will be affected during the construction period this includes river, sea, swamp or lakes.

HSE Site Representative shall conduct regular inspection and waste water sampling & analysis in all waste water collection and temporary storage area; all finding shall be documented and to be reported to HSE Manager. No waste water coming from the construction site will be discharge to this body of water without proper treatment or tested to be safe and will not harm any form of living things living in the environment.

Waste water that does not classified as safe to disposed to environment shall be collected by designated waste subcontractor and to be treated according to local environmental procedure. Waste subcontractor shall be monitored by HSE Manager if it is complying with the environmental standard by regular audit and inspection of its waste water treatment facilities and dumping area.

The impacts of storm water runoff will result in accumulation of pollutants in the collection system and could have an unacceptable impact on the receiving water body.

General guidelines are as follows:

- Environmental Supervisor shall monitor potentially contaminated storm water and skim free oil.
- Contaminated storm waters which run off from areas within the project shall be directed through appropriate treatment facilities.
- Runoff water's solid particle shall be allowed to subside before discharged.

Drinking water locations should be provided with hard standing area to prevent the accumulation of water on ground & same should be connected to sewage sump to be tinkered away. As the ground is rocky & water does not percolate into earth, it accumulates on surface leading to unhygienic conditions; hence water should not be allowed to collect on surface of earth.

Ground Water Quality

In addition to the contractual requirements, monitoring of the ground water quality will be carried out to ensure that construction activities are not having a significant impact on groundwater quality. Environmental Coordinator will ensure that groundwater is sampled on a yearly basis and analyzed for the following parameters.

Sr. No.	Parameter	Permissible Limit
1	pH	6.5-8.5
2	Nitrate (Total Nitrogen)	50mg/L
3	Total Dissolved Solids (TDS)	500mg/L
4	Arsenic	1mg/L
5	Lead	0.05mg/L
6	Fluoride	0.7mg/L

Table-1: NEQS/EPA Water Parameters

4.2.3 Noise Control

SABQ shall administer a continuing, effective hearing conservation program, as described in this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 dB(A) (10 TWA of 83dB(A)) decibels measured. For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with the applicable standard formula, and without regard to any attenuation provided by the use of personal protective equipment and other hearing protection program as required in Table 2.

Hazards of Exposure to noise include:

- Annoyance and irritation.
- Affects concentration and efficiency.
- Causes fatigue and accident proneness.
- Prevents ear from registering other sounds, instructions and warnings.
- Exposure to excess noise causes damage to the inner ear and can lead to permanent loss of hearing.

Job Rotation:

- Providing rest rooms or acoustic refuges.
- Re-arranging work locations to limit conflicting work hazards.
- PPE (ear plug, ear muffs).

Monitoring noise values associated with Construction Equipment:

- Posting signs indicating high noise areas.

OSHA Standards		
Sound Level (dB)	**Duration (Hours: Minute: Seconds)**	**Damaging Effect**
85	16:00:00	Annoying. Damage begins after long term exposure.
90	8:00:00	
95	4:00:00	
100	2:00:00	Loud and uncomfortable. Loss of hearing with continuous exposure.
105	1:00:00	
110	0:30:00	
115	0:15:00	
120	0:07:30	
125	0:03:45	
130	0:01:53	Painful and irreversible damage.
135	0:00:56	
140	0:00:28	Painful and traumatic injury (irreversible hearing loss).
145	0:00:14	
150	0:00:07	
155	0:00:03	
160	0:00:01	

Table 2: Permissible Limits of Sound Levels and Its Effects

4.2.4 Soil Erosion

The excavated or embanked area, shoulder on side slopes or borrow pits are the area where soil erosion are likely to occur during heavy rain. To avoid soil erosion, all exposed surface shall be regressed or covered by stone pitching, lining concrete, spill way and compaction of the embankment area shall be carried out.

4.2.5 Ozone Depleting Refrigerants

SABQ and all the subcontractors shall slowly phase out the refrigerants if they are ozone depleting in nature. Any new equipment involving refrigerants should only be Ozone friendly. All subcontractors should submit an inventory of refrigerants & advise SABQ, how they intend to proceed with.

4.2.6 Vehicle/Equipment Emissions

In order to minimize exhaust emissions and associated impact on air quality during construction, the Site HSE Lead will ensure that all vehicles and construction equipment are being subjected to the following procedures:

- As per the E&P Inspection and Maintenance, vehicles and construction plant and equipment will be thoroughly inspected prior to being allowed access to the construction site. All construction plant and equipment is required to be inspected by a qualified mechanic employed by the plant / equipment owner, or the subcontractor using it, before they are brought into the construction site and, thereafter, at an interval of not

more than 3 months. Scheduled maintenance checks for vehicles and plant / equipment will include monitoring of exhausts to ensure emissions are within manufacturers specifications for relevant parameters (i.e. applicable to the specific equipment specs).

- In accordance with the site specific Logistics/Vehicle Management and Transportation Procedure, drivers will undertake a daily check of their vehicles prior to coming onto site and commencing construction activities. This inspection will include a check to ensure that there are no visible black exhaust fumes emanating from the vehicle, and this daily inspection will be formally recorded on a Driver's Daily Checklist. I/C HSE Site will check the outcomes of these Driver's Daily Checklists during walk downs.
- I/C HSE Site or Environmental Coordinator is responsible for ensuring that the following inspection and audits are carried out to verify that subcontractor vehicles and equipment complies with project requirements:

  - Daily random visual checks of vehicle and equipment exhausts at the construction site.
  - Weekly planned site inspections to include a check of vehicle / equipment exhausts.
  - Monthly Compliance Audits of self / subcontractors will include a review of vehicle / equipment maintenance records and Driver's Daily Checklists.

- Any vehicles or construction equipment generating excessive exhaust emissions will be immediately taken out of service for repair, fitting of emission control equipment, or replacement in liaison with the I/C E&P site.
- If any of the above requirements are not adhered to, I/C HSE site will have authority to stop work until the problem is rectified. If situation seems out of control, he will report to Head HSE Corporate.

4.2.7 Abrasive Blasting

The Site HSE Lead/In charge will ensure that subcontractors comply with environmental requirements with respect to abrasive blasting, and this will be achieved through the following procedure:

- Review of an approved MSDS for any blasting agent to be used on site to ensure that it contains less than 2% free silica (crystalline silicon dioxide). If required, I/C HSE Site will request that the supplier of any blasting agent provides confirmation from a certified Testing Laboratory that the agent contains <2% free silica.
- If an abrasive blasting medium is to be re-used, I/C HSE Site will ensure that the relevant subcontractor has appropriate procedures to remove dust or other particles which have contaminated the abrasive medium from previous blasting, and have performed an analysis to confirm that metal concentrations do not exceed the limits defined by regional Environmental Regulations. A complete JSA of the activity will be performed with consultation of concerned parties and job will be executed accordingly.
- I/C Site HSE will ensure that abrasive blasting is performed in a blasting enclosure or that appropriate measures are implemented to substantially reduce the generation of fugitive dust, which has the potential to cause a nuisance or health risk to employees and neighbors. He will also conduct inspections and audits, ensuring that blasting

subcontractors take all reasonable precautions to reduce the emission of fugitive dust during blasting activities.

- The Site HSE I/C will report the outcomes of any monitoring, testing and inspections related to abrasive blasting in Environmental report to Head HSE Corporate.
- If any of the above requirements are not adhered to, I/C HSE site will have authority to stop work until the problem is rectified. If situation seems out of control, he will report to Head HSE Corporate.

4.2.8 Ambient Air Quality

Air Quality Monitoring (AQM) shall be monitored to determine the existing quality of air, evaluation of the effectiveness of control program and to identify areas in need of restoration and their prioritization in accordance with contractual requirements. Air Quality Monitoring (AQM) Station will be measured prior to commissioning and operation phases, for continuous monitoring of the following parameters:

Sr. No.	Parameter	Permissible Limit (mg/Nm3)
1	Smoke	40% or 2 Ringlemann Scale
2	Sulphur Dioxides (SO_2)	1700
3	Nitrogen Oxides (NOX)	400
4	Particulate Matter	500
5	Hydrogen chloride	400
6	Hydrogen Chloride	400
7	Chlorine	15
8		
9	Carbon Mono Oxide (CO)	800

Table-3: NEQS/EPA Permissible limits

4.3 Waste Management

The waste management plan shall provide a practical guideline to identify all the wastes that will be generated throughout the construction of the project and to define options for their re-use or management.

The plan has been developed to ensure adequate response to the potential environmental impacts of the wastes produced by the project. It is designed to achieve and maintain environmentally sound practices for sanitation and for conservation of the environment.

To achieve this purpose, SABQ will emphasize the following:

- Ensure COMPANY's standards and Local Environmental Laws are implemented.
- Optimize the use and reuse of materials.
- Analyze the environmental implications of all works activities.
- Collect and dispose of waste promptly.
- Stringent housekeeping standards.
- Monitoring and inspection of all construction activities to ensure environmental compliance.
- Keep accurate records of all waste streams with a focus on reduction.
- Recycle/recovery by conversion of wastes into usable materials and/or extraction of energy or materials from wastes such as recycling scrap metals.
- Identify and evaluate new technology or methods applicable to waste reduction, recycling and disposal.
- Enhance employee and subcontractors awareness of waste minimization techniques.
- Effective training.

4.3.1 Waste Analysis

Waste shall be analyzed based on its physical characteristics as well as its chemical composition; proper waste analysis shall be the basis in waste segregation, disposal and containment.

a) Types of Wastes

1. Hazardous Waste

Waste materials are classified as hazardous wastes when they exhibit one or more of the characteristics shown below or are hazardous by definition. The rules for handling hazardous materials may be different from the rules for handling a non-hazardous waste.

Hazardous Wastes exhibit one or more of the following characteristics;

- Explosive
- Flammable
- Spontaneous Combustion Potential
- Oxidizing Potential
- Toxic
- Corrosive
- Reactive

A hazardous waste may be made non-hazardous by removal of the hazardous characteristic. Thus oily wastes- may be made non-hazardous by incineration of the oil, providing, of course, the ash is non-hazardous. Wastes that have too high or too low of pH may be made non-hazardous by neutralization, if that is their only hazardous characteristic.

2. Non-Hazardous Waste

Non-hazardous-wastes are all wastes that are not hazardous wastes and are not inert construction wastes. This includes common garbage, office wastes, construction wastes that are burnable such as boxes, and treated sewage effluent and sewage sludge.

3. Inert Construction Waste

Inert construction wastes are wastes that are solid and on disposal in a landfill are not reasonably expected to undergo physical, chemical, or biological changes to such an extent as to produce substances that may cause an adverse effect. Such wastes include but are not limited to demolition debris, concrete, asphalt, glass, ceramic materials, unpainted scrap metal, and dry timber or wood that has not been chemically treated, but does not include hazardous wastes.

Note that hazardous or non-hazardous wastes, herein, cannot contaminate the scrap metal and other wastes defined. Wastes contaminated with hazardous substances are hazardous by definition.

b) Waste Identification & Categorization

- Oily Waste
- Paint Waste
- Cement and Concrete Waste
- Vegetation Debris
- Scrap metal
- Wood Waste
- Glass
- Plastics
- Grit Blasting Waste
- Waste Batteries
- Tires
- Domestic Waste
- Medical waste including blood soaked materials, needles and syringe
- Drums and Barrels
- Hydro Test Fluids
- Radioactive Waste

4.3.2 Waste Management & Disposal

All the wastes generated during all phases of all Company's projects, ranging from the most inert to the most toxic shall be collected and managed in accordance with this procedure.

1. Waste Inventory

The Warehouse/Store In charge will maintain a waste inventory to keep record of the types and quantities of waste present at the job sites. This record shall be used to monitor the effectiveness of the waste management program. The waste inventory shall be maintained and managed as per Waste Management Procedure.

2. Waste Segregation

Given the complex nature of the waste, SABQ will undertake a waste segregation exercise involving sorting and separating waste on the basis of its characteristics. Waste materials shall be segregated at source by providing colored and marked (with universal symbols and written in English) bins for storing the waste. All employees will be trained on the procedures and importance of proper waste segregation.

3. Waste Collection & Storage

All waste generated on site will be removed promptly to the waste depot. Sufficient numbers of colored and labelled collection bins shall be located, in all waste producing areas. Each of these containers shall have a tight sealing lid. No waste collection bin shall be allowed to overflow before it is emptied, and waste storage receptacles shall be replaced promptly, in the event of damage.

Hazardous wastes shall be segregated from non-hazardous wastes and shall be kept in a separate lockable fenced area.

4. Waste Transportation System

Solid wastes will be collected regularly and transported to the appropriate disposal site. Sanitary wastes will be transported to the designated sewage plant by an underground sewer collection system where possible. Construction sanitary wastes in camps will be handled in chemical toilets. Contaminated soils will be collected by earth moving equipment, loaded into trucks, and transported to remediation or disposal site.

5. Waste Disposal Options

All disposal options will be contracted out to waste contractors approved by the appropriate Organizations and recognized by the COMPANY. Please refer to Waste Management Procedure (HSE-SOP-017) for brief description of waste disposal options. This could be in the form of;

- Landfill
- Surface Discharge
- Land Application
- Neutralization/Stabilization
- Reclaiming/Reuse
- Burial

4.3.3 Waste Handling, Training & Monitoring

Any worker or subcontractor employee who handles any type of waste will use Personal Protective Equipment (PPE) appropriate to the type of waste involved.

SABQ will develop and implement a waste tracking mechanism to monitor waste from the point of generation to final disposal. This tracking mechanism shall be subject to daily checks to ensure that all waste generated for a given day are effectively tracked, collected and treated.

Environmental Policy & concerns, including waste management, will be a part of the HSE Induction training that every employee will undergo. SABQ will give further training in project environmental procedures and requirements to the workers assigned to the environmental management team.

Environmental Awareness Training shall be conducted annually to all employees while a bi-annual training shall be conducted to all personnel that will be working or near hazardous substances.

4.4 Community Environmental Control

4.4.1 General Hazards

Project team should implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction.

Risks may arise from inadvertent or intentional trespassing, including potential contact with hazardous materials, contaminated soils and other environmental media, buildings that are vacant or under construction, or excavations and structures which may pose falling and entrapment hazards. Risk management strategies may include:

- Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community.
- Removing hazardous conditions on construction sites that cannot be controlled effectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials.

4.4.2 Noise Impact in the Community

Construction noise in the community may not pose a health risk or damage peoples' sense of hearing, but it can adversely affect peoples' quality of life. To some degree, construction noise can be a contributing factor to the degradation of someone's health in that it can cause people to be irritated and stressed and can interrupt their ability to sleep - all of which may

lead to higher blood pressure, anxiety, and feelings of animosity toward the people or agencies responsible for producing the noise.

In fact, several of the traditional definitions of "noise" (i.e. unwanted or undesirable sound) can be associated with construction noise. Construction noise can be perceived or considered to:

- be too loud
- be impulsive
- be uncontrollable
- contain annoying pure tones
- occur unexpectedly
- occur at undesirable times of day
- interrupt people's activities

Construction noise has the potential to disturb people at home in their residences, in office buildings or retail businesses, in public institutional buildings, at locations of religious services, while attending sporting events, or when on vacation.

Noise impacts can occur on any project involving the construction of any project. While the magnitude of the impact construction noise may have on a community may not be known early in the project development stages, measures can be implemented during the design phase that can help to reduce the anticipated noise impacts at sensitive receptors.

4.4.3 Mitigating the Effects of Noise to Community

The level of detail in a contract required to address construction noise mitigation is dependent on the complexity of the project, the amount and type of work required, and the sensitivity of the area beyond the project boundary. Therefore, not all projects require the same amount of detail.

The effective control of construction noise can be achieved in much the same manner as the control of operational traffic by considering the following techniques:

- Alternative design options
- Mitigation at the source
- Mitigation along the path
- Mitigation at the receiver

4.4.4 Air Emissions

Construction activities may generate emission of fugitive dust caused by a combination of on-site excavation and movement of earth materials, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind. A secondary source of emissions may include exhaust from diesel engines of earth moving equipment, as well as from open

burning of solid waste on-site. Techniques to consider for the reduction and control of air emissions from construction and decommissioning sites include:

- Minimizing dust from material handling sources, such as conveyors and bins, by using covers and/or control equipment (water suppression, bag house, or cyclone).
- Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content.
- Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements.
- Selectively removing potential hazardous air pollutants, such as asbestos, from existing infrastructure prior to demolition.
- Managing emissions from mobile sources.
- Avoiding open burning of solid.

4.4.5 Wastewater Discharges

Construction activities may include the generation of sanitary wastewater discharges in varying quantities depending on the number of workers involved. Adequate portable or permanent sanitation facilities serving all workers should be provided at all construction sites. Sanitary wastewater in construction and other sites should be managed as per Waste Management Procedure.

4.4.6 Traffic Safety

Construction activities may result in a significant increase in movement of heavy vehicles for the transport of construction materials and equipment increasing the risk of traffic-related accidents and injuries to workers and local communities. The incidence of road accidents involving project vehicles during construction should be minimized through a combination of education and awareness training. Road re-routing shall also be implemented.

Guidelines are provided by the Logistics and Transportation Safety. Vehicle and road safety procedures to be implemented

4.4.7 Community Complaint Control

SABQ will establish a community complaint control procedure that will handle all the process and requirements in dealing with the complaint that will be raised by the community during the construction period. The following shall be the guidelines to be followed in handling community issues;

- Consultation and information with the community regarding the effects of the construction in the area.
- Discussed the action to be taken by the Project management to lessen the impact of the construction to the community.
- Establishing an external environmental committee compose by the community leaders and project management.

- Collect and record in the Community Complain Log book all the complaint raised by the community.
- Discussed during project management meeting all the issues; immediate action shall be done by project management for the items that can be handled easily or needing immediate attention.
- Head Office and external agencies shall be sought for critical Items that cannot be handled easily by the project team.
- All legal requirements shall be followed.

4.5 Recyclables

Entities shall develop their waste management plan to ensure that waste materials are segregated (paper, wood, glass, plastic, metal, oil etc.) to facilitate material re-use and recycling to their maximum extent.

Plastic Drums/Empty plastic bottles

Plastic materials may be sent to the following vendor or any other entity involved in recycling of plastic. The waste consignment note is generated for each trip to the recycler.

Metal Drums

Scrap metal that is segregated is collected and the scrap is sent to the following vendor or any other entity involved in recycling of plastic. The waste consignment note is generated for each trip to the recycler.

Batteries

The Entity must segregate old batteries and store in a safe location. Appropriate safe handling methods must be applied during storage and disposal. Used batteries are disposed with the following vendor or any other entity involved in recycling of plastic. The waste consignment note is generated for each trip to the recycler.

Waste Paper

Waste papers are collected and a waste consignment note is generated and the waste papers/cardboard is sent to the recycler.

Vegetation

Vegetation if separated may be sent to designated locations for composting purposes. Otherwise it may send to land fill locations for general disposal.

Cooking Oil

Cooking oil from kitchen and mess is collected and sent the recycler.

4.6 Calibration of Monitoring Equipment

Site HSE Representative will be responsible for using monitoring equipment for the purpose of performing environmental monitoring and measurement will control the equipment. He will ensure that the monitoring equipment is suitably calibrated to provide valid and accurate results. The records of such calibration will also be retained. All environmental monitoring equipment will be calibrated / certified by recognized certification organizations at the manufacturers recommended frequency.

In accordance with the HSE Audit Procedure, Site HSE Representative will verify that all monitoring equipment has been properly calibrated in accordance with manufacturer's requirements.

4.7 Audit and Inspection

4.7.1 Audit

In accordance with the HSE Audit Procedure, I/C HSE Site will establish and implement an environmental audit program to ensure that Company employees and subcontractors are complying with applicable laws, legislation, regulations and guidelines.

This environmental audit program will include quarterly internal audits and 3rd party audit where deem necessary, but not be limited to, the following:

- Environmental monitoring results (including noise, dust, radiation, air quality, abrasive blasting agent and water quality).
- Monitoring equipment calibration records and competency of monitoring subcontractors.
- Waste management records, waste management contractor facilities, and operation of the site.
- Waste Collection Points and Central Onsite Waste Handling, Segregation and Storage Facility.
- Chemical management records (Chemical Inventory List and MSDS Register), chemical storage and handling areas, and fuel storage and refueling areas.

4.7.2 Inspection

In accordance with the HSE Audit Procedure, the I/C HSE Site, I/C Admin and Area I/C will undertake regular planned general inspections, routine inspections and random inspections to ensure that the Project environmental requirements are being implemented and adhered to, at all times, by company and subcontractors. Inspections will include, but not be limited to, the following:

- Identifying vehicles and construction equipment emitting excessive noise, so that they are taken out of service for repair, fitting of noise control equipment, or replacement in accordance with the Site specific Environmental management Plan.

- Continuous qualitative assessment during construction to ensure that visible dust plumes do not reach the property boundary of the adjacent tenant.
- Thorough inspection of vehicles and construction plant / equipment, to ensure that they are not excessively noisy or polluting, before they are allowed access to the construction site, in accordance with the Site specific Logistics and Transportation Safety Procedure.
- Daily/ continuous checks of vehicle and construction plant exhausts to ensure that they are not emitting visible black exhaust fumes or bad odors.
- Site inspections prior to the execution of any construction activities in a new area, and daily pre-work inspections prior to the commencement of activities.
- Fauna surveys, prior to commencement of any site preparation and construction activities on site, to identify the presence of fauna within the construction area and adjacent area, particularly in compliance with EIA/client requirement.
- Daily site environmental inspection of the construction site will include waste storages/collection center, waste skips and bins, to ensure good cleanliness and housekeeping and to ensure that wastes are properly segregated and stored in accordance with the Site specific Environmental Management Plan.
- Daily site environmental inspection will include areas where chemicals and fuel are being handled and stored, to ensure that there are no leaks / spills, proper labeling of containers, appropriate containment, integrity of storage vessels/containers, and proper handling and dispensing, in accordance with the Site specific Environmental Management Plan.

5.0 Training

All employees shall be given general training on environmental degradation and the impact of their activities on environment. Job specific trainings shall also include environmental impact of their job.

Environmental trainings shall include but not limited to following topics:

- Waste management process flow
- SABQ environmental policy
- Impact and aspect of various jobs
- Waste handling

6.0 References

- Health & Safety Executive (UK)
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ADNOC – HSE Management System Guidelines
- ISO 14001:2015 Environmental Management system

سبق
SABQ
DESIGN & BUILD

SABQ HEALTH SAFETY & ENVIRONMENT MANAGEMENT SYSTEM

EMERGENCY RESPONSE PLAN

Prepared and Issued by

SABQ Energy Contracting Group

Table of Contents

1.0 Introduction

1.1 Purpose

The objective of this procedure is to outline activities and responsibilities of employees in the event of any emergency. The emergency action and response plan ensures identification and notification of emergency conditions so that all employees are aware of situation, and establishment of action plan is effective to bring emergency situation under control.

1.2 Scope

This document shall be applicable to head office, workshop, shutdowns and all the project sites and construction activities of SABQ Energy Contracting Group Co. LTD. This shall also be applicable to any sub-contractor of SABQ working on any construction project.

2.0 Terms and definition

Assembly Point/Muster Area: A muster area or an assembly point is a location where people are to assemble after evacuating their workplace or work area due to an emergency. Muster areas are a common feature of many emergency evacuation plans. Assembly points are well marked so that everyone in the facility knows where they are located.

ERT: Emergency Response Team – Team designated to prepare emergency arrangements and respond to any incident. ERT assist the people to evacuate the area to a safe point during emergency.

Emergency: An emergency is an unexpected situation that endangers the safety of one or more individuals.

Head Count: The counting of the people at the muster point when emergency situation occurs and people evacuate to gather at safe muster point is called head count.

Spill: Spill is a release of a hazardous substance which poses a significant hazard and risk to the safety or health of employees in the immediate vicinity or to the worker cleaning it up and it has the potential to become an emergency.

Response Time: The time at which the unacceptable process condition (emergency) occurs to the time till all the people at the emergency area are evacuated and safely reach the muster point.

Violence: Any hostile or violent act, gesture and/or comment that harms or has the intent to harm another individual at workplace is termed as violence.

3.0 Roles and Responsibilities

3.1 Chief Executive Officer (C.E.O)

- Shall be owner of this procedure and has the final responsibility to ensure all the resources required for the implementation of guidelines as per this procedure and to meet in all possible emergency events.
- Shall integrate good health, safety and environment management with business decisions.
- Shall ensure that the company's emergency procedures all times in such a manner as to ensure, so far as reasonably practicable, the health and safety of all employees and others who may be affected by possible emergency occurrence.

3.2 Project Manager / Site Manager/ Works Manager

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for new or transferred employee to review that person's training record to ensure that all relevant training is identified and implemented.
- Shall be responsible to ensure availability of all resources required for the compliance of emergency details given in this procedure.
- Shall be responsible to allow the personnel to attend the emergency response training without compromising HSE critical activities.
- Shall be responsible to ensure that all emergency personnel's and equipment in place to tackle emergency.
- Shall be responsible to ensure that the hazards associated with multiple activities in their area of responsibility (including contractor activities) are managed in accordance with the requirements of this procedure.
- Shall be responsible to review and approve procurement requisitions: carries out checks and inspections to ensure that emergency equipment's are of good quality in respect of possible emergency events.
- Shall be responsible to ensure that emergency situation reporting to internal and external sources is available and implemented.
- Shall be responsible to take initiative review emergency plan after any incident, process changes, or change in workplace.

3.3 Corporate HSE Manager

- Shall be responsible for communications, trainings, and compliance audits for effective implementation of the requirements given in this procedure.
- Shall be responsible to ensure that individual supplementary trainings are identified and implemented.
- Shall be responsible to ensure that trainings are identified as per requirement, carried out as per training matrix and recorded.
- Shall be responsible for review of this procedure as per set frequency or on need basis.

- To ensure that plan is annually reviewed and continual improvement communicated via training with all emergency personnel's.

3.4 Sr. Manager HR-Admin/Manager HR-Admin/Site Lead HR-Admin

- Shall be responsible for the implementation of this procedure according to all the details given in this procedure wherever they are applicable in their areas of influence.
- Shall be responsible for resourcing any internal/external training needs identified by the IMS requirements.
- Shall be responsible to ensure that their employees are trained in accordance with the requirements given in this procedure.

3.5 HSE Lead (Head Office/Project Sites/Workshop)

- Shall be responsible to ensure that there should be adequate number of emergency equipment at site, offices and accommodation areas to meet any kind of emergency.
- Shall be responsible to plan, inspect and maintain all emergency equipment's periodically.
- Shall be responsible to provide foreseeable training to all employees.

4.0 Procedure

4.1 General Requirements

Each project must include emergency procedure arrangements which include following requirements.

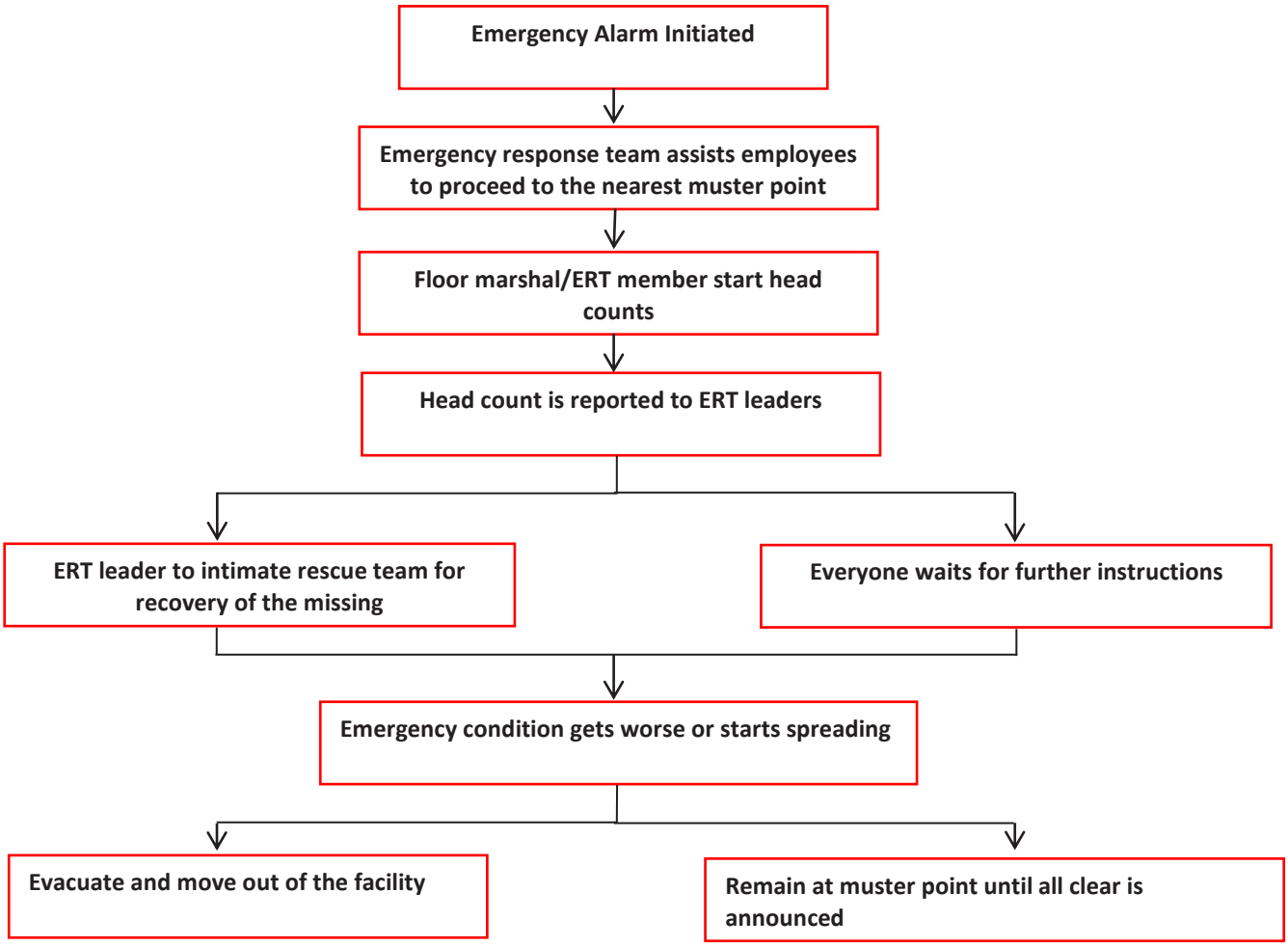
- Nomination of responsible staff
- Provision of Suitable equipment
- Evacuation Map
- Dealing with media
- Leadership and teamwork

All employees must follow the approved Emergency Response Procedure for their personnel and co-workers. Client's requirements and statutory regulations shall be incorporated into this emergency procedure.

Contact numbers of Emergency Response Team of the facility shall be displayed in the facility at several places so that it can be visible to all the workers. ERT contact numbers shall be listed in **Annexure A**.

Evacuation map of different facilities shall be displaced at various areas of respective facilities.

A general process flow given below shall be followed in case of emergency. This line of command may vary in certain cases depending upon the type of emergency and its response procedure.



Emergency Evacuation Process Flow

4.2 Response Resources

4.2.1 Emergency Response Team

The incident investigation and response team will assign salvage responsibilities in cases of major emergencies such as medical, fire, spills or weather related. Any project, workshop, site or permanent employee, or temporary contract employee may be requested to assist in an emergency response.

The local fire/rescue department shall be available for all fire and medical emergencies. There shall also be an onsite trained first aid and firefighting team to deal with initial medical

and small scale fire emergencies. All the nominated firefighters shall be given extensive training on fire and firefighting techniques.

Emergency response teams (ERT) shall consist of firefighting team representative or any trained person in using fire extinguishing equipment, first aid team, rescue/security team representative, representative from HSE department and a representative of admin. The team members and the number of the members shall be nominated as per the size of the facility and their responsibilities are as follows:

a) ERT Leader

Emergency Response Team shall be led by one or more team leaders. The ERT leader(s) shall be senior person of Admin, HSE or Project department like HSE Manager, Admin Manager or Project Manager. Responsibilities of ERT leader are as follows:

- Shall develop emergency plan considering disable people and the working area.
- Shall develop the ERT team as per the resources and assign roles to the team members.
- Shall reach the location of the emergency to evaluate the situation and extent of incident and call it as emergency if required.
- Shall be responsible to activate additional response contractors and local resources for the rescue or any external assistance in case of emergency.
- Evaluate the Severity, Potential Impact, Safety Concerns, and Response Requirements based on the initial information provided by the First Person On-Scene.
- Confirm safety aspects at site, including need for personal protective equipment, sources of ignition, and potential need for evacuation.
- Communicate and provide incident briefings to company superiors, as appropriate.
- Coordinate/complete additional internal and external notifications.
- Communicate frequently with Emergency Response Team, as the situation demands.
- Shall make sure the head counts are as required and communicate with rescue team if required.
- Shall communicate “All Clear” to the employees if stated by rescue team.

b) ERT Team Member

ERT team members include personnel from Admin department, HSE department or Execution at site. Members may be HSE Officers/Engineers, Area Engineers, Admin executive etc. The responsibilities of ERT team members are as follows:

- ERT team members shall be responsible to provide assistance to the employees at workplaces, offices, building floors etc. during the time of emergency evacuation.
- In situation of emergency, team members shall report Team Leaders about the on-going scenarios at regularly and take instructions from them.
- Shall take information from floor marshals about the status of each floor/site/area and communicate to the ERT leader.
- Shall communicate with employees for the awareness of evacuation procedures.

- Shall be at emergency situation to assist the orderly evacuation of people in the emergency area.
- Shall ensure through visual inspection or through inquiring from floor marshals that all people are evacuated from all working areas, buildings, floor, offices etc.
- Shall assist team leader while making emergency plan.
- Shall be familiar with the important information like assembly points, updated emergency numbers, exit routes etc.

c) Floor Marshal

Floor marshals shall be divided and assigned different areas to assist people while evacuating during emergency in their particular areas. Floor marshal shall be those people who have knowledge of the people in the area and shall be familiar with the area assigned to him. Following are responsibilities of floor marshal:

- Floor marshal should be aware of the number of people in his/her designated area and shall keep account of the people like visitors coming in and out on daily basis.
- Shall be familiar of their assembly points, exit routs, emergency number.
- The Floor marshals shall coordinate with the team members for the orderly evacuation of their floor/section of the building as follows:

  - Wear a visible and can easily recognized clothes/vest during emergency and drills.
  - Ensure all persons are evacuated from the all working areas, building floors, offices etc.
  - Assist persons with disabilities and visitors as necessary (pre-planning may be necessary to ensure persons with disabilities have assistance or are taken to a pre-designated safe area to be determined).
  - En-route to the designated exit, if there is no immediate danger to personal safety, ensures all windows and doors are closed; energized equipment is switched off, valuables secured.
  - Proceed to designated exit and remain outside the door to discourage re-entry to the workplaces until the “all clear” is given by Rescue In-charge and ERT Leader.

- Shall count the people gathered in the assembly area and inform the head count to ERT member and ERT leader.
- Shall search for the lost workers in case of emergency.

d) Rescue Team

In addition to the external rescue team like 1122, SABQ shall have rescuer/guards in the facility to protect the facility and people in it.

Emergency Response Team shall include rescuer/guards where applicable. Rescue team play an important role in emergencies like threats, workplace violence etc. Their responsibilities are as follows:

- Rescue team shall be vigilant and shall keep an eye the movement of people in and out of the facility.
- A record shall be maintained at the entrance gate for the people coming in and going out.
- In case of any threat, rescuer/guard shall report to Admin and wait for the further instructions.
- Restrict all unauthorized person to enter the premises unless being asked by the host.
- In addition to threats, rescue team shall be responsible to search and recover casualties and lone workers stuck in a remote location on site.

4.3 Response to Emergencies

4.3.1 Major Medical Emergencies

Major medical emergencies involve those cases that cannot be treated with basic first aid procedures like critical injuries and heart attacks, etc. Prompt and immediate action is key to potentially save a life.

Take the following actions anytime an employee, contractor, truck driver or visitor shows signs of profuse bleeding, loss of consciousness, difficulty in breathing, trauma, and other serious medical symptoms.

a) Contact for First Aid Assistance

Dial on any facility phone provided at the site by area authority to connect to site emergency team numbers provided on the site. Announce the following:

"**FIRST AID EMERGENCY! HELP NEEDED AT _____**"

* * * * * repeat * * * * *

"**FIRST AID EMERGENCY! HELP NEEDED AT _____**"

b) Dial 1122 to Initiate Emergency Medical Response

While the first aider at site will be providing the treatment or if the first aider is unavailable or contact is not possible, ERT Leader shall initiate the medical response by contacting rescue 1122. If any representative of emergency response team is unable to reach at the emergency location and the medical condition is critical, the first person on scene shall Dial 1122 from any mobile or landline available. Be prepared to provide the following information:

- Name: <<Your Name>>
- Location: <<Company, Site, Unit>>
- Contact Phone:
- Nature of Extent of Injury

- Emergency: Breathing (yes or no)
- Conscious (yes or no)
- Nature of accident (if applicable)

Do not hang up the phone unless instructed to do so by the 1122 operator.

Note:

In the event that a person is injured and no one else is present for the help or if the above mentioned tasks cannot be performed for whatever reason, pull the emergency alarm no matter what emergency has occurred. This shall activate the response.

4.3.2 Fire emergencies

The protection of personal safety is the first and foremost goal of the action plan for handling fire emergencies. An emergency response team shall be made to assist people in case of evacuation in emergencies like fire. The responsibilities of ERT are mentioned in section 4.2.

Initiating Emergency

- Location of the emergency alarms shall be identified and communicated to the team members by each supervisor. Supervisor shall also brief them about the evacuation path and assembly points using the evacuation map.
- Emergency shall be initiated when the fire has potential to spread quickly. This shall be done by pulling the emergency alarm.
- An audible and visual alarm signal will immediately notify all on-site personnel that an emergency alarm has been activated. This alarm signal initiates an evacuation from the job site.
- Emergency Response Team Members shall report to the zone to assist in the emergency.

Small Fire

Personnel that can attempt to extinguish the fire with the fire extinguisher if the following conditions exist:

- The fire is small,
- It can be contained,
- Personnel exposed to it are trained in the use of a fire extinguisher,
- Personnel have safe and clear access to a fire extinguisher,
- AND they have an available exit

If the first attempt to put out the fire fails, stop efforts and evacuate.

Large & Uncontained Fire

In case of a fire at larger scale and if it is spreading at fast speed, follow the below instructions:

- Stop the work.
- Manage your equipment.
- See the wind direction.
- Pull the nearest emergency alarm box to initiate evacuation.
- Move perpendicular to the wind direction towards the nearest muster point.
- Evacuate immediately and alarm all those you meet on the way out of the emergency.
- Notify the ERT of the details that should initiate the call for firefighting.

Personnel Accounting

Designated Emergency Response Team members shall initiate the head count at the muster point to ensure everybody is out of danger and has evacuated from the area of fire. In case of personnel missing, ERT representative shall inform it to the rescue team for the recovering of the missing personnel.

If the fire is extremely dangerous and huge that muster points are also under its range, then crowd has to evacuate outside the facility/plant at a safe zone and head count has to be done again to ensure all workers have safely evacuated.

Response Coordination

- The Emergency Response Team Leader will provide all sort of required support to the responding recue/firefighting team.
- All information about personnel trapped inside the fire area shall be provided to the rescue team in-charge.
- No one shall be allowed to re-enter the facility until the responding rescue team officer in charge announce an “ALL CLEAR” for re-entry.

4.3.3 Spill Emergency Response

During a spill event, the primary concerns are for the safety and health of all personnel on-site and to the environment. Under no circumstances should any potentially contaminated liquids be allowed to enter public sewers, drainage systems or natural waterways.

If a significant spill of hazardous liquid is observed, it shall be reported as an environmental incident to the environmental authorities of facility where spillage occurred. ERT shall decide if the emergency has to be initiated depending upon the environmental significance.

The following actions shall be taken in the event of a spill:

a) Report Spill to Supervisor/Manager

Any employee discovering a spill must immediately report it to their supervisor and/or the HSE Manager. If it is known or can safely be determined, the following information should be provided:

- Any injuries associated with spill
- Identity, location, and quantity of spilled material
- Other factors that may be important to the response. For example, increased irritating odor in the area, spill is migrating outdoors, etc.

b) Control/Minimize the Effect of the Spill

- If it is safe to do so, the employee may make attempt to control the spill by turning a valve, righting a drum, shutting off a pump, etc. If the employee is not comfortable in doing so or will be putting their safety and/or health at risk, the employee shall not attempt to control the spill until further assistance arrives.
- Avoid the Water Pollution, it is imperative to prevent and minimize releases of hazardous materials into the sewer and water storage area.
- If there is potential for the spill to migrate towards exterior doors or towards the storm sewer, spill absorbent mates and dikes should be built to prevent further migration of the spill.

c) Gather Information and Develop a Plan

- An MSDS for the spilled material should be obtained.
- Emergency Response Team members and HSE department shall always be available to assist in the assessment of any spill, anywhere at any time. ERT should be called to assist with clean-up activities when the spill is reported.
- A member of management or ERT member will develop and communicate a response plan that may include:

  - Proper PPE requirements considering MSDS and spill circumstances.
  - Need for ventilation.
  - Need for fire brigade watch.
  - Effective clean-up equipment and materials.
  - Need to barricade and/or evacuate areas or the facility.

4.3.4 Gas Release

Client's facilities dealing with Oil and Gas has a continuous risk of gas release and thus workers are in danger of exposure to a toxic gas.

If gas release is reported no matter what sort of gas, it shall be immediately be informed to Emergency Response Team. ERT shall decide what type of release that is and depending upon the condition, ERT leader shall call the emergency situation and call for the assistance from emergency department at the facility.

If it is safe to do so, the employee may make attempt to control the release by turning off a valve or blocking the source of release but if the employee is not comfortable in doing so or will be putting their safety and/or health at risk, the employee shall not attempt to control the release and shall evacuate.

Secure the area by evacuating the area of gas release and post "Do Not Enter" posting. Use the escape hood to avoid exposure to the gas.

If a worker gets unconscious due to exposure to the gas, he shall only be treated by first aid team or the doctor if present. Due to the unknown nature of the released gas, it can be fatal if effected person is provided something to drink or eat that reacts with the gas particles like if a person gets unconscious due to H_2S gas and provided with water, it produces Sulphuric acid inside the body which is deadly.

4.3.5 Emergency Inside Confined Space

A confined space emergency is defined as any action or event, whether inside or outside the confined space, which could endanger the persons working within the space.

If there are chances of gas release or fire inside a confined space, the rescue equipment shall be ready to use during the confined space job. Rescue equipment to be used by the rescue team includes a tripod with retrieval system and body harnesses to be worn by employees going into the confined space.

a) Gas Release

If for any reason during the course of working in the confined space an employee feels the smell of a gas or the gas detector gives an alarm or a person observes another employee becoming ill or unconscious due to a sudden or gradual release of a gas, it shall immediately be communicated to the confined space attendant standing outside. The attendant shall call for an immediate evacuation from the space and call for the rescue team to recover the unconscious person.

Workers shall use the breathing apparatus or escape hoods if the internal environment of confined space is toxic or there are chances of gas release.

b) Fire

During hot work inside a confined space:

The fire watch shall always be observing the hot work going on inside confined space and the area around him. He shall be in constant communication with the Confined Space Attendant who is stationed outside the confined space. Fire Watch shall notify immediately to the confined space attendant if he recognizes the fire and confined space attendant shall call rescue/firefighting team at the location.

Fire Watchman shall use the fire extinguisher if the fire is controllable with the fire extinguisher and if he feels that the intensity of fire is increasing he shall evacuate immediately with all the workers. Entrants shall evacuate as quickly as possible but without any panic.

In the event of a confined space rescue:

The attendant does not enter the confined space but immediately summons a rescue response from the on-site rescue team, using the means of communication described HSE-SOP-013.

4.3.6 Work at Height Emergency

a) Impact of Emergency

When a worker falls and is suspended in a harness, it's important to rescue him or her as quickly as possible because of the following reasons.

- The worker may have suffered injuries during the fall and may need medical attention.
- When workers are suspended in their safety harnesses for long periods, they may suffer from blood pooling in the lower body. This can lead to suspension trauma.
- Suspended workers may panic if they are not rescued quickly.
- The event that led to the fall may create additional risks that need to be addressed.

b) Response

If a worker falls and is suspended by a safety harness, implement the emergency response plan by following the steps below:

- The site supervisor and ERT representative (or alternate foreperson) take control of the situation.
- The site supervisor sounds the emergency alarm. All workers in the immediate vicinity of the incident stop working. The site supervisor quickly evaluates the situation and identifies any further hazards that could arise.
- The site supervisor or ERT go to get help if workers are close by. If no one is close enough, the site supervisor calls for help.

- The site supervisor/ERT calls the rescue team at facility or local police, fire or ambulance if required.
- The crane operator remains on standby. The operator frees the hook and waits for further direction in case the designated rescue team must perform a basket rescue.
- The ERT (or a worker assigned to the task) isolates the accident zone and its perimeter to limit further exposure.
- The ERT (or a worker assigned to the task) moves all non-affected personnel to a safe zone or directs them to remain where they are.
- The site supervisor/ERT assembles the emergency rescue team at the accident site as quickly as possible to determine the best rescue procedure for the situation.
- Rescue can be done in the following ways:

  - Elevating Work Platform Rescue
  - Ladder Rescue
  - Rescue from Work Area or Floor Below
  - Basket Rescue

4.3.7 Workplace Violent Threats

Workplace violence can be the result of domestic instability, emotional duress, hatred, and crime. Every employee needs to be vigilant to protect against workplace violence. This violence may result in fights, using of arms, people being hostage etc.

The following actions shall be taken in the event of a threat or actual incident of workplace violence.

a) Report Threat

As soon as any person comes to know about any unusual threatening information about the violence at the workplace, he/she shall inform it immediately to the immediate Supervisor/Head. The supervisor needs to report the matter to their departmental head where the issue can be discussed with the HR Manager so that appropriate precautions can be taken.

b) Action Against Threat

When situations like threats of harm, violent assault, being hostage and or reckless violence is present, the immediate actions to be taken are:

- Avoid interaction with or exposure to the personnel involved in the violence. Do not engage or negotiate with the perpetrator, as that is the work of the police officer.
- HR Manager shall contact police at 15.
- HR Manager shall initiate the local facility guards to protect the employees as per their capacity without any violence.
- Perpetrator shall be kept as calm as possible.

- Protect people by evacuating the immediate area if possible.

4.3.8 External Emergencies

Serious external incidents like protests and riots can impact the ongoing activities at job facility and threaten the health and safety of all personnel on-site. This emergency situation may vary at times but it shall be taken seriously every time it occurs and shall be dealt with a proper plan to take people to a safe place.

The following actions shall be taken:

a) Gather Information and Develop a Plan

The ERT shall gather as much information as possible about the external situation and level of threats and shall notify the people in the facility of the situation. ERT leader can have information from the following information sources:

- Local news or radio
- Calls
- Web sites

Notify onsite manager or on-call manager of situation and develop a plan.

b) Notification

Once the external scenario has been evaluated by ERT using different resources and contacting with local authorities like police/security, the ERT leader shall call personnel to central location and communicate the situation and expected response (i.e. evacuate, stay indoors etc.).

c) Monitor Situation

External situation shall be monitored continuously and update response actions accordingly.
ERT leader shall provide updates to staff and managers until situation has resolved and safe exit to the living area/homes is possible.

4.3.9 Bomb threat

All the bomb threats and information received about the nearby bomb, terrorism and domestic violence shall be taken seriously.

The following actions shall be taken in the event of a bomb threat.

a) Written Bomb Threats

- Handle written bomb threat notes as little as possible in order to preserve fingerprint, handwriting, postmarks, typewriting and other evidence.
- The person receiving written bomb threats should save all items connected with the note, such as the envelope and its contents.
- Notify your supervisor immediately. Make sure the written contents are saved in a secure container. The supervisor will contact the HSE Manager and/or the HR Manager immediately.
- The Police shall then be contacted and a response will be coordinated with the responding police officers.

b) Phoned Bomb Threats

The bomb threat can be received on call. The person taking the call should try to give someone nearby a note. That individual will contact the HSE Manager and initiate the Police call while the person on the phone keeps the caller engaged.

The following can help the person taking a bomb threat call respond appropriately:

- Remain calm. Be courteous and don't interrupt the caller.
- Note whether the caller is male or female, an adult or a child.
- Keep the caller on the phone as long as possible. Don't hang up until the caller does. The phone company may be able to trace the call if you stay on the line long enough.
- If the caller ID screen on landline or screen on mobile displays the caller's phone number, write it down.
- Ask questions to get information. Write all information down. Try to find out the following:

  - The location of the bomb?
  - Who and where the caller is?
  - When the bomb is set to explode?
  - How the caller knows about the bomb?
  - Whether other bombs have been placed and where?
  - What kind of bomb it is and what it looks like?
  - Why the bomb was placed?

4.3.10 Weather Emergencies

Serious inclement weather can have a threatening impact on the health and safety of all personnel on-site.

The following actions shall be taken in the event of a weather emergency:

a) Floods

If a continuous rain is expected as per the weather forecast or it is observed that the continuous rain may turn into a flood or if there is any news of an expected flood through

nearby rivers/sea, Emergency Response Team shall be initiate their activities by keeping information about the changing weather conditions and keep the employees updated about the situation.

ERT leader shall evaluate the situation and prepare for evacuation in case of the situation gets worse. Employees and all site personnel shall be instructed to go to the restrooms keeping away from the flooded area until the warning is lifted.

When the immediate weather threat is over the ERT leader shall evaluate that condition of the plant before calling "All Clear" for the people.

b) Major Weather Storms & Fog

Regional storms like blizzards, ice storms and hurricanes present unique challenges and their presence may be felt for many days. Similarly dense fog makes the visibility zero while driving in an open area, thus enhancing the risk of road accidents. The Project Manager along with ERT leaders will take the lead role in monitoring conditions, communicating with the local authorities and with the employees about the operational status of the Facility.

Employees shall call directly to ERT leader to inquire about the condition at the job location. No matter what the status of the facility is, employee as an individual knows the conditions in his/her residential area and the employee must make a decision determining if travel is safe. When road conditions are poor and employee has to drive to work, he/she shall take the following precautions:

- Let someone know where you are going,
- Use double indicators while driving,
- Drive slow and cautiously.

4.3.11 Earthquake

- If people are indoors, they shall stay there. If they are in danger:

  - Get under a sturdy table or desk.
  - Brace yourself in an inside corner away from windows.
  - Move to an inner wall or corridor. (A door frame or the structural frame or inner core of the building are its strongest points and least likely to collapse. They will also break the impact of any falling objects).
  - Choose shelter which will provide an airspace if it collapses. If the furniture shelter moves, stay under it and follow it around the facility.
  - Watch for falling objects - plaster, bricks, light fixtures, pots and pans, etc.
  - Stay away from tall shelves, china cabinets and other furniture, which might slide or topple over.
  - Stay away from windows, sliding glass doors, mirrors.

- Grab anything handy (blanket, pillow, tablecloth, newspapers, box, etc.) to shield your head and face from failing debris and splinting glass.
- Don't be alarmed if the fire alarm or sprinklers go off at any client's facility.

- Do Not Rush Outside. Stay on the same floor that you are on. Stairways may be broken and exits jammed with people. Do not use elevators as the power for elevators may go out and leave you trapped. The greatest danger from falling debris is just outside doorways and close to outer walls. If for safety reasons you must leave the building, choose your exits as carefully as possible.
- If you are outside, stay there. Move away from the building, garage, walls, power poles and lampposts. Electric power lines are a serious hazard - stay away from fallen lines. If possible, proceed cautiously to an open area.
- If you are in a moving car, stop. Stop as quickly as safety permits in the best available space. Stay in your car. Don't stop where buildings can topple down on top of you. A car is an excellent shock absorber and will shake a lot on its springs during an earthquake, but it's a fairly safe shelter from which to assess your situation.
- Avoid Fallen Power Lines. The possibility of encountering fallen live wires is great during and after an earthquake. If you are on foot, make a wide path around the wires. If you are in the car and live wires have fallen across the car, remain where you are. Your car is usually well insulated and will protect you from electric shock. Never assume that downed power lines are dead.

4.4 Post Emergency Investigation

After emergency events other than the natural disasters, HSE department shall investigate the incident in detail including gathering factual information, analyzing data information, finding immediate and root cause, finding and implementing control measures to avoid reoccurrence and record the data. Incident investigation shall be carried out as per HSE-SOP-041: **Incident/Accident Reporting and Investigation.**

5.0 Training

Emergency response training focuses on developing the critical skills needed to survive an emergency. These training programs teach individuals a range of response procedures including building evacuations, shelter-in-place, and active threat survival, medical handling, and spill handling, toxic gases etc.

Concerning emergency preparedness, general training for employees must cover:

- Individual roles and responsibilities;
- Threats, hazards, and protective actions;
- Notification, warning, and communications procedures;
- Means for locating family members in an emergency;
- Emergency response procedures;
- Evacuation, shelter, and accountability procedures;

- Location and use of common emergency equipment; *and*
- Emergency shutdown procedures.

5.1 Training Frequency

- Employees shall be trained on the contents of this SOP upon initial response/job assignment and when procedures/conditions change or as needed.
- At least one response scenario shall be tested and documented in six months (i.e. fire drill, spill response).

5.2 Record Keeping

- Training records shall be maintained in the training database or in the SABQ files.
- Documentation of emergencies, spills and releases, follow up critiques, and training will be maintained in the SABQ files.
- This procedure shall be reviewed at least annually or updated as necessary to reflect accurate emergency response information.
- This emergency plan shall be maintained at the facility, readily available in event of an emergency incident.

6.0 References

- Health & Safety Executive (UK)
- NIOSH Standards (National Institute of Occupational Safety & Health)
- ADNOC – HSE Management System Guidelines
- ISO 45001:2018 Clause 8.2 Emergency Preparedness and Response
- OSHA 1910.38 Emergency Action Plan
- OSHA 1910.106 Flammable Liquids
- OSHA 1910.155-164 Fire Protection
- National Fire Protection Association

7.0 Attachments

- Annexure A: Emergency Response Team Contact Information