CONTRACTOR GUIDE TO SAFETY

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1. Purpose

This guide is designed to provide contractors a reference source for basic health, safety, environmental and security rules, procedures and precautions to be used while performing work at Bapco facilities.

A publication of this size cannot encompass all of the safety procedures for every situation or condition, but does provide general guidance to reduce potential incidents and control losses. This guide is not intended to replace a contractor safety program nor summarize all the safety, health and environmental standards governing the contractor's operations.

The primary focus of Bapco HSE program is to prevent incidents and control losses. It is our intention that EVERY individual goes home in the same condition as they came to work. Arrive home safely to your family. Familiarization with this guide will help accomplish our goal of an injury- free facility.

Should situations arise which are not covered in these guidelines, or if you have a question about a guideline, contact your supervisor and he will answer it or contact Bapco CHSEM Co-ordinator HSE Department for clarification.

2. Responsibilities

2.1 Contractor Responsibilities

The contractor's company is responsible for the contractor's employees' safety and for ensuring that the contractor's employees perform their day-to-day work in a safe and proper manner. The contractor must read, become familiar with, and follow the contents of this guide to safety and consult with Bapco's supervisor if the contractor has any questions about its contents.

The contractor must become familiar with Bapco's requirements and expectations, many of which are presented in this guide to safety. These guidelines are intended to supplement, not replace, the contractor's own safety program.

2.2 Contractor Site Management

The Contractor Site Management is responsible for the establishment and administration of the Contractor Safety Programme including:

a) Assuming full responsibility for all safety activities of the Contractor and maintaining liaison with Company Management.

b) Where applicable, appoint a suitably qualified person as Safety Officer.

c) Appoint suitably qualified staff and supervisors and delegate responsibilities to promote departmental and craft safety activities.

d) Incorporating safety factors into bid and planning stages and ensure the provision of suitable and sufficient equipment, including Personal Protective Equipment (PPE), in order that the work is carried out with minimum risk.

e) Institute safety meeting and training programmes, accident investigation and reporting systems and monitor their effectiveness.

f) Promote a high safety profile by personal example by participation in safety

meetings, inspections, audits and implementation of Contractor safety incentive schemes.

2.3 Contractor Safety Officer

The Contractor Safety Officer shall:

a) Advise Contractor Management on all safety related issues, requirements, procedures and safe work methods.

b) Evaluate potential hazards in Contractor activities and advise on ways to prevent injury to personnel, fires, and damage to plant/equipment.

c) Monitor Contractor site compliance with safety standards and requirements through site visits and inspections and report and correct unsafe work methods or conditions.

d) Co-ordinate accident/incident investigations including determining of causes, recommending corrective actions and follow up. Assess accident trends and review overall Contractor safety performance.

e) Evaluate use and suitability of personal protective equipment provided, ensure they meet required standards and where necessary make RECOMMENDATIONS FOR IMPROVEMENT.

f) Participate in all weekly, monthly and progress safety meetings and co-ordinate with supervisors in conducting weekly tool box meetings for workforce.

g) Prepare and submit the necessary reports relative to the safety programme and supervise the maintaining of all safety related records.

h) Participate with the Company ***Health, Safety & Environment*** department in training programmes, emergency plans and exercises.

i) Participate in T&I / Shutdown activities.

j) ***Develop Risk Assessment for jobs performed at Bapco facilities in line with permit to work procedure.***

2.4 Contractor Supervisors/Engineers

The Contractor Supervisors/Engineers shall:

a) Be familiar with Contractor HSE Programme, Company Safety Standards and requirements and ensure compliance by Contractor all employees.

b) Plan and organize sites so that work is carried out to the required standard with minimum risk to men, equipment and materials.

c) Give precise instructions on responsibilities for correct work methods.

d) Be familiar with the Company Permit to Work Standard.

e) Plan and co-ordinate good housekeeping.

f) Report all Incidents

g) Check that the correct equipment and tools are available and maintained in good operating condition.

h) Ensure that suitable Personal Protective Equipment is available to, and is used by, Contractor employees. PPE must be in line with Bapco specification

i) Co-ordinate with Contractor Safety Officer in correcting unsafe practices and eliminating hazardous conditions.

j) Develop Job Safety Analysis (JSA) or Method Statement for jobs performed at Bapco facilities in line with permit to work procedure.

3. Safe Work Permit (SWP)

3.1 Permit to Work Process

The Permit to Work (PTW) Process, a formal written process, is also a means of communication between responsible persons, such as supervisors, operators, contractors, and others involved in the planning and execution of work tasks. It is vitally important that each individual knows his/her own responsibilities and duties and carries them out properly.

The main functions of the PTW Process are to ensure the proper authorization of designated work:

– Make clear to people carrying out the work the exact identity, nature and extent of the job, the hazards involved, and any limitations on the extent of the work and the time during which the job may be carried out.

– Specify the precautions to be taken, including safe isolation from potential risks such as hazardous substances and electricity.

– Provide a procedure for times when work has to be suspended, i.e., stopped for a period before it is complete.

– Provide for the cross-referencing of safe work practices and associated permits for work activities that may interact with or affect one another.

3.2 Safe Work Permit

A Safe Work Permit is a legal document that forms part of a safe system of work and gives written permission to perform work, when a permit to work is required. The Safe Work Permit is the primary permit to work and is complemented by a number of associated Certificates, which are used to authorise different types of work, list additional control measures and record gas tests.

Each Safe Work Permit must be accompanied by a risk assessment – either a Job Safety Analysis for low risk work, or a RAMS (risk assessment and method statement) for high risk work.

A Permit to Work will be required for the following:

All work performed by one Bapco department (or an authorised contractor acting on its behalf) on property or equipment belonging to another department anywhere in the Company's operating areas or in Awali township.

Individual departments may also utilise the Permit to Work System to authorise work within their own departments in cases where one Section of a department performs work in another Section of the same department (e.g. OS&E Marine Engineering employees working in Marine Operations etc.).

Note: **The only exception to this requirement is for work in those areas and/or operations specifically excluded and listed in the Permit to Work System User Training and Reference Manual - Waiving of Permit to Work Requirements.**

3.3 Hot Work Certificate

A certificate authorising certain categories of work, the performance of which could lead to the creation of fire. Examples of types of work requiring a Hot Work Certificate are listed in the Permit to Work System User Training and Reference Manual – Examples of hot work.

3.4 Crane Certificate

A certificate which authorises the operation of a crane anywhere within the Company's operating areas, or in Awali. A crane is considered to be any mobile crane or other vehicle fitted with a boom such that the boom is capable of lifting or of movement relative to the vehicle chassis.

Refer to the Permit to Work System User Training and Reference Manual for details on crane operations not requiring a Crane Certificate.

3.5 Road Closure Certificate

A certificate which authorises the partial or full closure of any road in the Company's operating areas or Awali. The Road Closure Certificate is normally created, circulated and approved electronically via the Bapco portal. Paper forms exist, which act as a back-up, in case of computer system failure.

Refer to the Electronic Road Closure Certificate folder on the HSE Dept.'s web site - New Permit to Work System.

3.6 Confined Space Certificate

A certificate which authorises entry into a confined space. A confined space is considered to be any place which is substantially enclosed and with limited means of access and exit. In addition, any partially enclosed area from which escape in the event of an emergency could prove difficult shall be considered to be a confined space for permit to work purposes.

Examples of confined spaces are: tanks, pits, trenches, sumps, vessels, sewers, pipes, furnaces, boilers ducts, tunnels, wells, manholes, cellars, separators, columns, reactors, compartments within rooms, parts of machines, vehicles or other similar places.

3.7 Excavation Certificate

A certificate which authorises excavation or digging with any type of tool (including hand tools) or machine, or for driving spikes, including earth/grounding rods. Excavation work may be defined as any ground penetration, of any depth.

3.8 Special Hazard Certificate

A certificate which authorises work on Company property involving any of the following:-

a) Radiographic Inspection.
b) Work with Asbestos.
c) Chemical Handling.
d) Work on Leaded Tanks or Leaded Pipework systems (TEL contaminated).

There are 4 categories of work requiring the issue of a Special Hazard Permit prior to work commencing;

I) Radiographic inspection: That is, any work involving the use of ionising radiations will require the issue of a Special Hazard Permit. However, special exemption from this requirement is granted to Awali Hospital Radiography section for the normal operation of Radiographic equipment in the Hospital

ii) Work with asbestos: That is, all work involving the handling of asbestos containing materials or materials suspected of containing asbestos will require the issue of a Special Hazard Permit. The work will be undertaken in accordance with the procedures laid down in the occupational Health Standard No. OS/550/OCH/003/SH.

iii) Chemical handling: That is, all work involving the open transfer of chemicals from drums, tanks, and similar vessels into any process operation, requires the issue of a Special Hazard Permit.

e) Work especially exempted from this requirement is any such work taking place within the Technical Services Dept. Control Laboratory, and in process operations for routine activities carried out by qualified operations personnel as part of their normal duties.

iv) Lead tank cleaning: That is, all work inside a tank or vessel known to have, or suspected of having contained leaded fuels requires the issue of a Special Hazard Permit. All work authorised by this permit must be undertaken in accordance with 'Octel' recommendations for Leaded Tank Cleaning.

The cleaning and repair of tanks which have contained leaded gasoline at some time in their service history presents potentially serious health hazards to those involved in all aspects of the operation. It is considered that a biological monitoring programme is essential in order to minimise the risk of over exposure to toxic lead compounds.

The programme is designed to cover two distinct groups. Those involved in cold work, including the tank cleaning group and those involved in hot work.

The Procedure should be as follows:

a. The Industrial Medical Officer (IMO) or his designate shall be informed at least 7 days in advance of any proposed tank cleaning or repair operation.

b. All members of the tank cleaning group must report to the Refinery Clinic before commencing tank cleaning operations.

c. All members of the tank cleaning group must report to the Refinery Clinic at the direction of the IMO during the cleaning operation

d. All members of the tank cleaning group shall report to the Refinery Clinic at the cessation of the cleaning operation. At the same time, personnel requiring access to the tank or designated mask area should report to the Clinic before entering the tank. This requirement covers entry for the purpose of inspection.

e. All personnel involved in hot or cold work, after the tank is cleaned, must report to the Refinery Clinic as directed by the IMO during and after the hot or cold work programme.

3.9 Diving Certificate

A certificate that authorises diving operations on Company controlled property or premises.

Unless otherwise stated, all diving operations in Bapco will be conducted using (SSDE) surface supplied diving equipment, in certain cases the use of (SCUBA) self-contained underwater breathing apparatus, can be used although the minimum requirements as per the Bapco Diving Standard must be adhered too, SCUBA will only be used for light swim survey work, any work involving ‘hands on work’ will only be conducted using the SSDE.

All diving contractors will have a formal technical qualification audit carried out by the Bapco Diving Officer, and each individual Supervisor, Diver will undergo the trade test interview and examination prior to been approved for work within Bapco.

Monthly dive site/ subsea audits and diver recovery exercises are conducted by the Bapco Diving Officer along with a full annual diving audit at the contractors place of work, this will comprise of personnel, equipment and procedure inspections.

Bapco requires diving operations to be conducted for the following tasks:

LLPH, HLPH, Wharf and NIW Fire pumps, Sitra Tanks Fire pumps – these are routine work conducted monthly (Cleaning and Inspection of the subsea strainers / screens and suction bay areas)

Sealines – all submerged sections of the pipelines, require periodic inspection, repairs and replacement.

Cathodic Protection – all cathodic protection anode beds, require periodic inspection, repairs and replacement.

Subsea structures (Sitra Wharf, T-Head and NIW) – require NDT inspections

Marine craft – cleaning, inspection and repairs are routinely required on marine craft.

Mooring buoys situated South of the Sitra Wharf, require (6) monthly inspections, cable replacement as requested. Other work, generally, replacement of fender panels, surveys, (including CP and UT readings along with GVI and CVI inspections) assist in installation of oil spill booms, air lifting, free span rectification of sea lines,

General surface swimming activities for replacement of surface pipeline spools in areas not accessible from the surface.

Subsea inspections, Audits and Technical work can be carried out by the Bapco Diving Officer as requested.

3.9.1 Special Hazard Certificate / Qualification Requirements:

Diving qualification requirement is as per U.K H.S.E Diving regulations,

All diving personnel working within Bapco will hold as a minimum a (H.S.E Part 3 inshore surface supplied diving qualification or equivalent).

All diving and life support equipment will be maintained as per IMCA D018.

As per normal diving practice, all diving operations will be planned without any in-water decompression.

Diving contractor supervisors are to be competent in the operation of a decompression chamber and can run the basic decompression treatment tables and are to be fully fluent with the USN air decompression tables.

All diving operation time limits and dive profiles will be written and followed as per the USN ‘air’ diving tables latest revision (7).

Each diving operation will be risk assessed and RAMS will be produced along with a dive plan and an emergency response plan, the emergency response plan will include, primary, secondary and emergency recompression facilities and treatment tables.

For further clarification on Diving requirements, regulations, individual roles and responsibilities etc. please refer to the Bapco Diving Standard [MTCE/PM/000/GENE/6]

3.10 Isolation Confirmation Certificate

A certificate that is used to record the isolation status of process equipment accompanied by a marked up sketch, or reference drawing. Contractor must follow Bapco isolation procedure which will be addressed during the pre-job meeting, JSA/RAMS development, and/or issuing of the Permit to Work.

When isolation procedure is used, a Bapco Operations lock will be the first lock on before turning the equipment over to the contractor and the last to be removed upon completion of the work.

Contractors will apply their own locks in addition to Bapco locks and tags already in place.

3.11 High risk

A situation where people are exposed to danger which could result in death, serious injury or serious health effects including life shortening diseases.

3.12 Low risk

A situation where people are exposed to danger which will not result in serious injury, but could result in less serious or minor health effects

3.13 Property Owner

The Manager of the Department or area (or his delegate) in which the work is to be performed. Property can include an area, building, facility or equipment owned, leased or operated by Bapco.

3.14 Job Owner

The Manager of the Department (or his delegate) responsible for the facility or equipment for which the permit to work is being requested. In most cases the Property Owner and Job Owner will be the same person.

The Job Owner (or his delegate) shall normally be the Primary Approving Authority but in certain cases the Property Owner may request that his Department issues the permit.

3.15 Approving Authority for Permits

* A Bapco employee occupying a position authorised by the Company to approve permits, and holding a badge signed by Manager Health, Safety and Environment (HSE) Dept. authorising him to do so, in accordance with Standard No. OEMS/SAFE/SWP/PERM/3 Certification of Approving/Issuing and Receiving Authorities for Permits to Work.

3.16 Primary Approving Authority

The Approving Authority, usually the Property Owner or his delegate who, in the case of permits to work that require approval by more than one department, specifies the required co-approving signatories and adds his own control measures before forwarding the permit

to work to concerned parties for co-approval. He is the last person to approve the permit to work before it is issued.

3.17 Co-approving Authority

A Bapco employee occupying a position authorised by the Company to approve permits to work and holding a badge signed by Manager HSE authorising him to do so.

Departments that are required to co-approve permits are stipulated in the "Approving Authorities" section of the Safe Work Permit by the Primary Approval Authority.

Safe Work Permits that have been co-approved must be returned to the Primary Approving Authority before the permit to work is first issued, so that any additional control measures listed by the Co-approving Authority can be viewed and discussed, if necessary.

3.18 Issuing Authority for Permits

* A Bapco employee occupying a position authorised by the Company to issue permits to work and holding a badge signed by Manager HSE authorising him to do so, in accordance with Standard No. ***OEMS/SAFE/SWP/PERM/3*** Certification of Approving/Issuing and Receiving Authorities for Permits to Work.

3.19 Receiving Authority for Permits (Job Supervisor/Craftsman)

* The person (Bapco or Contractor employee) responsible for the work being performed and who is authorised by the Company to receive permits, and holding a badge signed by Manager HSE authorising him to do so, in accordance with Standard No. ***OEMS/SAFE/SWP/PERM/3*** Certification of Approving/Issuing and Receiving Authorities for Permits to Work.

3.20 Job Watcher

A person (Bapco or Contractor employee) authorised by the Company to perform the functions of Job Watching.

3.21 Grade 1 Rigger

A Rigger, either a Bapco or Contractor employee, certified by Bapco Rigging Services Section as competent to supervise and direct crane lifting and rigging operations.

3.22 Crane Test/Inspection Certificates

3.22.1 Certificate of Worthiness for Bapco owned Cranes (BP2995)

A certificate issued by Plant Maintenance Department (Auto Maintenance Section) certifying that a Bapco owned crane has satisfactorily completed all service checks and has a valid Crane Test Certificate BP3338-8 issued by Bapco Rigging Services Section.

3.22.2 Contractor Mobile Crane Inspection/Test Certificate (BP3731)

A certificate issued by Bapco Rigging Services Section confirming that a contractor's crane has been tested in accordance with Bahrain Law and Company regulations.

3.23 Electrical Distribution Authority

An authorised representative of Power & Utilities Department - Electrical Distribution Section.

* **3.24 Permit to Work System User Training and Reference Manual**

The Permit to Work System User Training and Reference Manual is the main reference document for the operation of the permit to work system. It defines health and safety good practice and the procedures to be followed to control work effectively in all areas of the refinery operation. The manual is available in the QA Document Management System (DMS) in the Safe Work Practices binder.

4. Reporting of incident

Incidents are defined as identifiable and unintentional deviations from planned operations, caused by factors that may or may not be within Bapco's span of control, that result in an injury to an employee or contractor or cause environmental consequences, property damage, or a near miss that could have resulted in any of the above. All incidents, near misses, property damage, spills, releases, fires, harassment, and permit violations must be reported as soon as possible to Bapco personnel. A Bapco incident report must be completed and any statements needed for the report must be taken at that time. Failure to report an incident may result in termination of the contract.

Any contractor who has incurred a recordable injury (Lost Time or Non-Lost) or illness while working for the Bapco business units must schedule a meeting with Bapco Chief Executive, GM of Contract owner, Mgr. HSE to review the details of the incident and any lessons learned. This meeting should be scheduled within a reasonable time frame.

If an Incident/Near Miss occurs the Employee" must cease work and give immediate attention to first aid and to Emergency procedures if required.

Immediately conduct Risk Assessment

Incidents shall be reported to direct Bapco supervisor and investigated in accordance with Standards OEMS/IIR/000/GENE/3

Contractors shall maintain a record of all accidents/ incidents that occur on Company property and provide Company with documentation as required. This includes near miss reports and occupational illness reports.

4.1 Incident:

An undesirable event or deviation from reasonable expectation that results in or could result in loss, damage, or harm.

4.2 Lost Time Injury:

An injury arising from or in association with work which results in the injured person being absent from work on his/her next scheduled working day or shift.

4.3 Near Miss Incident:

An undesirable event which, under slightly different circumstances, could have resulted in harm to people, damage to property/environment or loss of process.

4.4 Occupational Illness:

Any abnormal condition or disorder of an employee whether immediate or delayed, not resulting from an occupational injury, but caused by exposure to environmental factors associated with employment.

4.5 Non-Lost Time Injury:

An incident in which an employee sustains an injury in association with work which does not result in absence from work on the next scheduled working day or shift.

i) Contractor Lost-Time Injury

The Chairman of the Contractors Safety Committee shall lead the investigation, assisted by FH&S Department and Bapco department(s) and Contractors involved.

ii) Contractor Non-lost Time Injury and First Aid Cases

The Contractor involved shall investigate with the Designated Bapco Owner of the Contract and report the findings in the in the Incident Investigation software tool (Quality & Compliance Management System (QCMS) Incident Investigation System (IIS) module) (or on form BP4066 if the Software tool is unavailable. Forward this form to the Chairman of the Contractors Safety Committee.

5. Smoking

It is now generally accepted that exposure to environmental tobacco smoke (ETS) is hazardous to health. In BAPCO, where air-conditioned offices are the norm, recirculated tobacco smoke is unavoidable; building filtration systems cannot remove the particles and gasses of ETS from the ventilation supply system in a typical building recirculation system.

All Bapco buildings and process facilities are designated as “nonsmoking” areas, except for areas specifically designated for smoking. Smoking is permitted only in designated smoking areas. Smoking is not allowed in any common use area, such as Process units, Tank Farm, offices, cafeteria and restrooms.

5.1 No Smoking Rules

In order to fulfil the Company's stated policy aims, the following rules will be in place with immediate effect:

Smoking is prohibited throughout the Company at all times inside all offices and all types of buildings, whether air-conditioned or not. This prohibition is applicable to all buildings regardless of size or function.

This will mean that smokers may smoke ONLY in open air areas where it is permitted or in smoking shelters where provided by the Company.

Department Heads are requested to advise their employees of the location of designated smoking shelters in their respective areas.

In areas designated as "NO SMOKING for safety reasons i.e. process areas, a total restriction will be in force.

5.2 Company Transport

Smoking will not be permitted in Company buses at any time or in other Company vehicles when passengers are carried.

5.3 Violations

The purpose of the policy is not to take away the individual's right to smoke, but to restrict smoking in the workplace. Whilst all smokers are urged to quit smoking, it is stressed that any violations of these rules will be subject to disciplinary action.

6. Emergency procedure

Bapco Departments have established emergency response plans, including a Major Incident that is documented in Fire Instructions Standard SS/300/FIR/101/SH and Crisis & Emergency Response Plan (CERP).

Report all emergencies by dialling 5555 from any in-plant phone. From an outside plant phone dial 1775-5555. Give your name, location, type of emergency you have. Wait for the information to be repeated back to you and confirmed before hanging up unless it is unsafe to do so.

Contractor Management and Supervisors shall familiarize themselves with these procedures in plants and areas in which they have work activities. This shall include types of alarm, action in the event of an alarm, emergency telephone numbers and emergency assembly point locations.

Site specific emergency procedures shall be prepared by the Contractor and submitted as part of the Contractor Health and Safety Plan. The procedure shall interface with Company emergency procedures and shall clearly define Contractor workforce actions in the event of an emergency.

Contractors shall have access to Company emergency procedure documentation at pre bid stage.

When a fire/emergency occurs, employees and contractors with no responsibility for fire related work in the area shall keep off the roads, stay entirely away from the scene of the incident, and also refrain from using the telephone.

Guests and visitors shall remain in their current locations unless directed otherwise by Company personnel.

6.1 Bapco Contacts

Emergency Number:

All Company Locations
(Awali Offices, Refinery, Sitra Wharf, Marketing Terminal)

DIAL	5555	FOR	FIRE AMBULANCE SECURITY

Outside Bapco

DIAL	1775-5555	FOR	FIRE AMBULANCE SECURITY

HSE Department Contact:

Coordinator CHSEM - Refinery	1775-7047
Safety Officer – Awali	1775-3742

Security Department Contact:

General Assistance - Refinery		1775-5506
Shift Office -	Awali	1775-3639

7. During An Alert

An alert in any of the Company's operating areas is signified by the sounding of the alarm. Each Wednesday at 12 noon, the alarm is sounded, and may be identified at that time. When the refinery, Marketing Terminal and Sitra Tanks alarm sounds it will be followed by an announcement over the radio PA system.

There are specific, and compulsory, requirements laid down by the Company during an alert, these being:

k) Do not operate vehicles during any emergency. Move the vehicle to the side of the roadway, shut it off and leave the keys in the ignition and proceed on foot to an Assembly Point.

ii) All plant and equipment i.e. welding machines, compressors, excavators, loaders, etc. must be switched off immediately.

iii) All work must cease immediately, regardless of its nature or location.

iv) Permits of any description must be returned to the issuing authority, for his retention.

v) In the event of the source of the alert being in an area where non-emergency personnel are/have been working, they must immediately evacuate that area, on foot and assemble in a safe location for roll-call.

vi) Access into the Refinery, Sitra, Wharf, or Marketing Terminal installations is restricted to essential personnel and equipment only, and therefore gate areas should not be congested with non-essential vehicles.

When the cause of the alert is brought under control, the "All Clear" will be sounded, a continuous tone lasting approximately 15 seconds proceed back to your work site.

Work may not commence until operations has re-issued your permit or updated and initialled the old one.

Only then can traffic movement recommence, and permits be reclaimed to allow work to continue.

DO NOT START WORK AGAIN UNTIL THE PERMITS ARE RE-ISSUED.

8. Personal Protective Equipment (PPE)

Contractors shall provide their employees with an adequate supply of personal protective equipment including **Fire-Retardant Clothing (FRC)** that conforms to Company specifications and standards. Contractors shall ensure that PPE and RRC are worn at Bapco operating facilities.

PPE requirements shall be determined during the pre-bid stage, depending upon general systems of work, identification of hazards associated with the process involved, and type of work to be carried out.

All contractor employees who need to use personal protective equipment shall be properly instructed in the use, cleaning and maintenance of such equipment.

Contractor supervisors shall regularly inspect protective equipment and damaged or defective items shall be immediately removed from the jobsite and replaced.

Contractor supervisors shall enforce the use of the required correct protective equipment and, in the case of violation, take appropriate disciplinary action in accordance with their Disciplinary Code.

9. Risk Assessment

IN Bapco there are two types of risk assessment a Job Safety Analysis (JSA) for low risk jobs and a Risk Assessment and Method Statement (RAMS) for high risk jobs. One of these should be use to execute any Job in Bapco - this is a mandatory requirement.
The JSA breaks the job down into individual steps and is prepared at the job site by the person responsible for scoping the job. It is designed to communicate to the Approving Authority the exact nature of the work, as well as to identify job related hazards and the associated control measures required to prevent those hazards causing harm.
The Approving Authority is responsible for assessing the overall risk posed by the job and communicating any workplace hazards via the Safe Work Permit, in writing, to the Receiving Authority.
The RAMS, by definition, comprises a method statement detailing the method of work and a risk assessment that quantifies the associated risk. It is used to determine the adequacy of existing controls and to ensure that the residual risk has been reduced to As Low As Reasonably Practicable (ALARP) using a Risk Matrix.
The RAMS is subject to a safety review and approval meeting convened by the Owner and attended by relevant Subject Matter Experts e.g. Safety Section, Occupational Hygiene, Rigging Services, PED Technical Support, RED etc. More details may be found in the Risk Assessment and Hazard Identification Standard SS/370/PSM/424/SH available at

10. Working at height

Work in any place above, at or below ground level or means of obtaining access to, or egress from, such place while at work, (except by staircase in a permanent workplace), where a person could sustain an injury through falling and/or by a falling object.

10.1 Ladder

12. Because ladders are in everyday use, they are taken for granted, and as a result, are the cause of more accidents than any other item of equipment. Before use, ladders should be checked for possible defects such as:

    i) Split splintered, warped or bruised stiles. (A bruised stile absorbs moisture and encourage decay);

    ii) Unduly worn or split rungs;

    iii) Loose wedges or tie rods;

    iv) Split or frayed feet. Aluminium ladders should be checked for bent or damaged styles, damaged, loose or missing rungs, and that the ladder is fitted with secure non-slip bases.

13. If a ladder cannot be properly repaired, discard it.

14. Due to the presence of overhead cables throughout Company areas, timber ladders are preferred, and shall be of natural colour, protected from weathering by a wood preserver and clear varnish. Paint hides defects.

15. Ladders should always be erected so that reinforcing wire is to the underside of the rungs, and should be placed on a firm, level base, giving support to both stiles equally.

16. Ladders must always be lashed or clamped near the top to some convenient, secure anchorage to prevent the base from slipping outwards and the top from sliding sideways. The correct slope for a ladder is 75o to the horizontal, i.e. 1 ft. out from the base for every 4 ft. in height, and all ladders must extend at least 3'6" above any landing place, or beyond the highest working rung.

17. Ladders fixed vertically to scaffolding shall be securely clamped in a minimum of 3 places along its length on each stile, and shall not have any of its rungs obstructed by intermediate transoms.

18. When working from a ladder, one hand should be free to hold onto a rung or site and if the character of the work requires, a safety belt should also be worn, and be securely fixed.

19. Tools and materials should be carried in suitable pouches or hoisted to the work area.

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20. Climb and descend ladders using two hands.

21. Ensure rungs and stiles are free from oil, grease or dirt.

22. Work, climb and descend ladders facing them.

23. When erecting scaffolding over/by water the scaffolder must wear a life jacket.

24. Scaffolding is viewed as a specialised function, and Company regulations prohibit the erection of scaffolding in excess of 2m above grade or water levels by any persons other than the Company's Specialist Scaffolding Contractor.

25. The risks attached to improperly erected scaffolding are not obvious to the untrained eye, and are therefore dangerous and unexpected.

26. The most common use of scaffolding is in providing working platforms, and a properly constructed working platform will afford the worker as safe a working environment as would be enjoyed at ground level.

10.2 Scaffolding Safety

Scaffolds are temporary elevated platform structures, which must be provided for all work that cannot be done safely from ladders or from permanent or solid construction. Erection and dismantling of scaffolds must be performed under the supervision and direction of a qualified person experienced with or trained in scaffold erection, dismantling, and use, as well as knowledgeable about the hazards involved.

The common elements used in scaffolding are:

i) Standards (or uprights) - the vertical supports which bear the weight of the structure and its load.

ii) Ledgers - horizontal tubes which connect standards longitudinally an which may act as support for transoms.

iii) Transoms - tubes which span between ledgers and may support a working platform.

iv) Buttresses - inclined tubes bearing on the ground or the suitable anchoring point at one end, and fixed to the scaffold other to widen the effective base width and increase the structure's stability.

v) Braces - tubes fixed diagonally across the length and/or the width of a scaffold, or through a scaffold to increase its stability.

vi) Ties - tubes used to maintain stability in a scaffold connecting it to the building or structure.

vii) Sole plate - timber plank or similar which distributes the load bearing on each standard over a greater area, and serves to provide a level footing on which to erect the scaffold.

Although scaffolding is considered specialised, it is important for all operatives to understand what makes up safe scaffolding, in order to recognise deficiencies, and have them rectified before any work begins.

10.3 The Working Platform

The Bahrain Government's minimum standards state a working platform shall be:

i) Closely boarded;

ii) At least 28" wide if used only as a footing;

If used for the deposit of materials, wide enough to allow the full width as at (ii), in addition to the material;

iv) Provided with guard rails to a height of at least 3'3" above the platform, and with toe-boards at least with 6" high. The distance between the lowest rail and the top of the toe-board, shall in no case exceed 2'10";

v) So constructed that the space between the edge of the platform and any building/ structure be as small as practical, and in no case to exceed 13".

Any and every board forming part of a platform shall be:

i) At least 1-¼" thick if supports are not more than 3'3" apart; 1-½" thick if supports are not more than 4'6" apart; and 2" thick if supports are not more than 9'0" apart;

ii) At least 8" wide except 2" thick boards, which shall be at least 6" wide;

iii) Be supported by at least 3 transoms;

iv) Not project more than 4 times its thickness beyond its last support, or be very tightly fastened so that it may not overturn;

v) Not, so far as possible, overlap another board;

vi) Be free from cracks, twists, holes or other defects which may affect its load bearing strength.

27. Scaffolding must be designed and constructed with its anticipated service in mind. In the event that the service changes, e.g additional loads applied, all works must stop, the scaffold classified as incomplete, and the necessary modifications carried out before any personnel are allowed to return to work.

28. On no account should scaffolding be used until advised as complete by the specialist scaffolder, and the "SCAFFOLDING INCOMPLETE - do not use" sign removed.

29. With mobile tower scaffold, dimensions will vary according to needs, but the corner standards should never be less than 4 feet apart, and the height should not exceed 3 times the shorter base dimensions. Wheels shall be at least 5 inches in diameter and fitted with brakes which cannot be accidentally released.

30. The maximum height of any static tower shall be limited to 40 feet, and 30 feet for mobile towers. The usual requirements of toe boards, board spacings and handrails shall apply.

31. Though the scaffold and its maintenance remains the responsibility of the specialist scaffolder, this refers to the integrity of the structure, and not to cleanliness and good housekeeping of its platform. Remove unnecessary materials, rubbish or obstructions, to provide as clear a passageway or work area as possible and remove oil and grease immediately from stairs, ladders, handrails and platforms.

32. The following safety checklist should be reviewed before commencing any works.

    i) Is it securely anchored?

    ii) Is the frame correctly assembled per the aforementioned requirements?

    iii) Will the scaffold support the intended load?

    iv) Are the scaffold boards evenly supported and spaced?

    v) Is the whole structure adequately secured to prevent undue movement?

    vi) Are toe-boards and guard rails properly positioned and secured?

    vii) Is the access ladder of a suitable quality and securely fixed.

11.Safety rule

32.1 Hot Environment

Due to environmental conditions in Bapco, heat can be a major health hazard that should be recognized in job planning and JSA/RAMS activities. Contractors are responsible for ensuring that appropriate controls are identified and in place to ensure the safety of their employees before beginning work. Appropriate controls include, but are not limited to, personnel acclimatization, work mission duration, and regularly scheduled breaks.

Fatigue is also a factor in incidents or risk to personnel working in hot environment. When workers feel fatigued, they should notify their supervisor and handle their fatigue appropriately. Contractor companies are responsible for monitoring employee activities and behavior to determine if an employee should be removed from the work site to obtain rest or should be given a rest period upon arriving at the work site before beginning work.

- When working in hot environments the most commonly used indicator of thermal comfort is air temperature. Although it is an important indicator to take into account, air temperature alone is neither a valid nor an accurate indicator of thermal comfort or thermal stress. Air temperature should always be considered in relation to other environmental and personal factors.
- The best precaution is to avoid exposure to the hot environment altogether or if this is not reasonably practicable to reduce exposure to the minimum necessary to achieve the task safely at all times.
- If the working environment can't be modified e.g. as in a building or confined space or enclosure, then means of cooling and humidification or dehumidification should be provided. Air movement alone, e.g. by fans, may not provide adequate cooling if the external air is at a high temperature, under these conditions some other means of engineering or administrative controls may be required such as air conditioning etc..
- **Note 1:**
- There is a legal requirement in Bahrain (ref iii) that bans work conducted under direct sunlight between 1200 midday to 1600 hrs during the months of July and August. This applies to all construction activities but excludes activities that are directly linked to the operation of the Refinery such as shipping, marketing, refining and maintenance work that relates to the availability of the units. It is not intended to exempt maintenance activities NOT directly related to the availability of the units and in these cases **scheduling of work** should be the primary control measure.

The following bullet points should be considered when preparing these documents:

1. Schedule maintenance and repair work in hot areas for cooler months.
2. Schedule hot work for the cooler part of the day.
3. Acclimatize workers by exposing them for progressively longer periods to hot work environments.
4. Reduce the physical demands of workers.
5. Use relief workers or assign extra workers for physically demanding jobs.
6. Provide cool water or liquids to workers (avoid drinks with caffeine, alcohol, or large amounts of sugar).
7. Provide shade at the worksite for the task in hand

8. Provide rest periods with water breaks.
9. Provide cool areas for use during break periods.
10. Consider air conditioning the work site for work inside confined spaces such as columns, vessels, enclosures and sewer boxes.
11. Monitor workers who are at risk of heat stress. Wear light-colored, loose-fitting, breathable clothing such as cotton.
12. Avoid non-breathing synthetic clothing.
13. Be aware that protective clothing or personal protective equipment may increase the risk of heat stress.
14.

32.2 Chemical Handling

Contractors

The Contractor's Manager shall be responsible for ensuring that the appropriate information about the hazards his workforce are being exposed to has been communicated to them and also to provide the basic training highlighted in Clause 6.7 to his Supervisors. The Contractor Supervisors or Safety Officers in turn have a responsibility through ***Tool Box Talks (TBT) or 5-Minute Safety Talks etc.***to communicate the day to day hazards and control measures to be used to his Contractor workforce and to monitor and enforce them.

The Contractor shall only use chemicals that have been approved and listed within his contract, or Bapco approved chemicals or chemicals addressed through a mechanism such as that described in Clause 6.1 General Requirements. In all cases the Contractor shall have an SDS and this should have been previously approved by the Senior Occupational Hygienist.

Training

All Managers at Interest and Contractor Managers shall ensure that their employees have been trained in the basic use and understanding of ***SDS's*** with specific reference to the chemicals an employee may use in his work.

At a minimum, the following information should be discussed prior to starting work where hazardous substances are to be utilised:

- Chemical Product Identification
- Health Hazard Data
- First Aid Measures
- General Control Measures
- Personal Protection
- Physical and Chemical Properties
- Fire and Explosion Hazard Data
- Reactivity Data
- Storage & Handling
- Spill Procedures.

32.3 Inspection

Safety Inspections

- Contractor shall conduct a programme that ensures that all of the work activities are periodically inspected and monitored to comply with safety standards, procedures and requirements. The programme shall include but not be limited to physical conditions of plant worksites, workshops, offices, stores, laydown areas, equipment, machinery and tools etc. Inspection forms and checklists shall be developed to support this programme.
- Contractor Management, Supervisors/Engineers and Safety Officers shall participate in the schedule which shall be recorded.

32.4 Safety Meetings

Contractors shall establish a specific programme for meetings at all levels to communicate safety commitments and requirements and achieve the full involvement of the entire workforce in safety issues.

The following meetings shall be included in the programme:

- One safety officer, one supervisors and site in charge must attend Contractors Health Safety Environment Committee (CHSEC) Meetings (monthly)

- Contractor In-House Safety Meetings (monthly), minute of meeting to be send monthly for CHSEC Chairman.

- Workforce Tool Box Meeting (weekly) by Safety officer

- Workforce Tool Box Talk (Daily) before starting the work, the topic should be extracted from JSA or risk assessment, the extracted portion should be relevant to the task that will be performed.

-In addition specific safety meetings and team talks shall be held before any critical task is performed.

-Safety shall be included as a topic in Contractor kick off, progress and other scheduled, recorded meetings.

- Minutes/details of all safety meetings shall be recorded and kept by the Contractor. Where required, Contractors shall make copies available to ***Health, Safety & Environment Department - Chairman CHESC.***

32.5 4 Keys to Safety

This simple risk assessment tool is the official subjective safety tool in Bapco and seeks to engage the heart and mind, encouraging employees to think carefully before conducting any task. This concept is embodied in a 'heart and mind' approach. The mind is always present when performing a task, so the real questions then are:

i) When performing that task, was the mind fully engaged or only partially?"

and

ii) Was the mind sufficiently engaged?

Through the 'heart and mind' approach we hope to engage employees' hearts or emotions before they perform any task, to prompt them to fully engage their mind (and attention), so that all injury and incident risks are identified and dealt with. The Four Keys to Safety tool is used to engage both the heart and the mind to avoid injuries and incidents. It consists of four questions: two to engage the heart, and two to engage the mind. These four questions are used in a card format; the aim is to make all employees familiar with these four questions and encourage them to ask themselves these questions before performing any task. These four questions are:

a) Heart

i) Who do I care about most?
ii) Who would suffer most if I am hurt?

b) Mind

i) How could I hurt myself or someone else doing this task?
ii) How can I do it safely?

The 'heart' questions are emotionally driven by our love and concern for those dearest to us. By thinking about our loved ones and how they might be affected if we are injured, we will be more motivated to engage our mind fully as we consider the next two 'mind' questions. The cards are distributed to all employees and contractors.

32.6 Stop Work Authority (SWA)

Stop Work Authority (SWA) establishes the responsibility and authority of any individual to stop work when an unsafe condition or act could result in undesirable event. In general terms, the SWA process involves a stop, notify, correct, and resume approach for the resolution. This is authorized by the Company CE.

Contractor is required to follow Bapco Osool. All contractors are authorized to stop and are responsible for stopping any work that does not comply with Bapco Osool.

It is Bapco's commitment that there will be no consequences upon any contractor for taking such action. The contractor is empowered and expected to stop the work of co-workers, Bapco employees, or other contractors if any person's safety or the environment are at risk. No consequences will result from this action.

32.7 Good Housekeeping

It is the contractors' responsibility to keep their work areas clean, orderly, and in a condition conducive to safe work while under Bapco's operational control.

- Any construction site is a dangerous place to be. Heavy equipment, hot works, scaffolding etc., all carry their own hazards, but are essential to the work, and the risks must be recognised, and minimised. One often ignored, but essential element of safety, is good housekeeping, i.e., keeping the worksite, or office tidy, so as to eliminate hidden hazards, and reduce the chances of an accident occurring.
- Materials such as rags, papers, wood shavings etc. all pose a fire risk, and if not required, should be properly disposed off. Otherwise, they should be stored in metal containers with close fitting lids, and stacked well away from buildings or huts.
- Flammable materials such as paints, solvents etc. must be stored under cover in a proper suitable area.
- Likewise, re-usable timbers should be properly stacked, and special emphasis should be placed on denailing to reduce the risk of accidental cuts or puncture of the skin.
- Surplus excavated material must be removed from site daily, and should never be a substitute for properly installed barriers.
- Cables powering tools are tripping hazards, and should be elevated to a suitable height to prevent "snagging" by personnel and equipment.
- Clean up spillages of flammable liquids, oil, greases etc., immediately they occur. Don't leave it to somebody else.

32.8 Plant, Tools & Equipment

- Contractor Equipment

  Contractor Equipment Checks
- The Diesel and Auto Section of Plant Maintenance Department shall check all contractors' mobile equipment annually and affix a tag to the equipment. The tag shall indicate the date when the next inspection is due.
- Records of inspections shall be maintained and administered by the Diesel and Auto Section. Details shall be entered into the QRS - Equipment Monitoring System and be kept up to date.
- Contractor shall conduct regular inspections to ensure that all vehicles, mobile equipment, power and hand tools are maintained in good order. Defective equipment/ tools shall be removed from site and repaired or replaced.

CONTRACTOR MOBILE CRANE INSPECTION & TEST CERTIFICATE BP3731

This certificate is approved and issued by S/D&MM - Rigging Services confirming that a contractor's crane has passed checks, including load checks, as established and recorded by S/D&MM - Rigging Services section.

The certificate is normally valid for 6 months, but may be restricted to a shorter period by S/D&MM - Rigging Services section. If known faults require correction, it must be withdrawn or suspended by the S/D&MM - Rigging Services section.

NO permit for crane operation for a contractor's crane may be issued unless a valid Contractor Mobile Crane Inspection & Test Certificate BP3731 is available in the cab of the vehicle.

32.9 BOOST

Process description for behavior based safety – Behavioral observation obtains safe trends (boost).

BOOST Process aims to achieve improved safety performance as a result of using behaviour based process designed to reduce and prevent injury using the following principles:

- Establish safety as a value, both at the individual and organizational level.
- Identify opportunities to positively reinforce safe working practices.
- Identify and correct deviations from safe work standards & practices.
- Create and maintain a culture that allows open, honest communication; and creates a dialogue that promotes safety as a priority above any other.
- Foster a culture of care and concern where individuals strive to minimize risk to themselves and others

The BOOST process can be described by the following steps:

1- Training of BAPCO and Contractor Employees as Observers.

2- BOOST Observations conducted by trained Observers on employees and contractors.

3- Observation results are entered into the Rincon software by designated BOOST data entry persons within every department.

4- Analysis of the data and feedback to the employees. Each department is responsible for their own department data analysis.

5- Steering Committee conducts meetings at least quarterly to ensure alignment on implementation of BOOST process throughout the company. Steering Committee is also responsible for monitoring the health of the process and recommending action plans to maintain the health of the process..

6- Barrier Removal Team meets at least semi-annually (or as required by the steering committee) and review, prioritize and remove barriers that have been identified during the observations. All Barriers removal actions will be tracked through “Corrective Action Preventive Action” database.

7- All Barriers removal actions will be tracked through “Corrective Action Preventive Action” database.

8- Steering committee will conduct an annual review of the ICB forms to ensure that all critical behaviors are captured.

32.10 Osool Bapco

OSOOL Bapco include three key principles based on key lessons learned from past incidents which were identified from study of root causes of refining operation incidents.

The Osool Bapco principles are:

- Do it safely or not at all
- There is always time to do it right
- If in doubt, find out

OSOOL Bapco

Always:

1. Work within design or environmental limits
2. Work in a safe and controlled condition
3. Ensure safety devices are in place and functioning
4. Follow safe work practices and procedures and insist in others doing the same
5. Meet or exceed customers' requirements
6. Use dedicated systems for their intended purpose only.
7. Comply with all applicable laws and regulations
8. Address abnormal conditions and never let them become accepted as normal
9. Follow written instructions / methods for high risk or unusual situations
10. Involve the right people in decisions that affect people, procedures, or equipment

OSOOL Bapco is a "Code of Conduct" for our daily behaviours that apply all the time to all employees and Bapco contractors, whether in an office or operating environment. They reflect a fundamental belief that if OSOOL Bapco are ALWAYS followed, mistakes that lead to incidents can be avoided. The essential word in OSOOL Bapco is "ALWAYS", without exception. It is intentionally used instead of words such as "sometimes or "most of the time.

OSOOL Bapco becomes inbuilt in our culture through meaningful discussion and action, not simply by being posted on the wall.

32.11 Disciplinary Code

Contractor shall have a written code of discipline for all employees under their control. This document shall define violations and subsequent disciplinary action and shall be displayed on Contractor notice boards.

The disciplinary code shall conform to Bahrain Ministry of Labour Regulations.

32.12 Fit for Duty

Contractors are responsible for ensuring that employees who are sent to work under Bapco's operational control are physically capable of performing their job function. This includes a pre-employment physical for all contractor personnel.

To meet this responsibility, the contractor must train their employees to:

• Implement and enforce their safety program, and ensure that all employees are properly trained for their assigned tasks.

• Ensure that personnel assigned to work at Bapco locations are fit for duty and physically capable of performing all aspects of their jobs.

• Follow safe work practices and procedures.

• Provide their employees with proper personal protective equipment in good working condition.

• Notify a supervisor when the employee is taking medication, both prescription and nonprescription, that could impair his/her ability to work safely.