Health, Safety & Environment Management System Manual

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Healthy, Saftey and Enviromental Policy

The Petroleum Projects and Technical Consultations Company (PETROJET) is a leading Egyptian Company specialized in carrying out the execution of petroleum and industrial projects comprising refineries, oil and gas field development, petrochemical plants, trunk pipelines and infrastructure projects, in addition to fabrication of structural steel, static equipment, offshore platforms and pipe coating.

The company is fully committed to the principles of Health, Safety and Environmental Performance which encompass the framework of operations and accommodates the requirements of management, staff, sub-contractors and the society, while applying integrated management systems for the environment, occupational health and safety leading to continual performance improvement.

The above will be achieved through:

- Top management commitment to prevent injury and occupational diseases and continual improvement in Environment, Occupational Health and Safety Performance.
- Strict compliance with local and international standards, in addition to all laws ,legislations and other requirements related to the scope of work to ensure avoiding, reducing and controlling the elements that affect occupational health, safety and environment with the aim of preventing damage.
- Setting positive objectives and availing a suitable work environment, while reviewing these objectives to enhance HSE performance.
- Review the policy periodically, and as required to ensure that it remains compatible with PETROJET's scope of work.
- Optimum utilization of resources & equipment and application of latest technologies to cope with the sustainable development leading to improvement of work performance and loss prevention.
- Giving special attention to staff training to develop their personal skills in carrying out their tasks and increasing HSE awareness.
- All accidents, incidents and near misses will be investigated in order to prevent recurrence.

(This policy is published and fully realized by all staff working under the control of PETROJET and available to public)

سياسة السلامة والصحة المهنية وحماية البيئة

شركه المشروعات البترولية والاستشارات الفنيه "بـتروجـت" شركه مصريه متخصصة في تنفيذ المشروعات البترولية والصناعيـــه و تشمل إنشاء معامل التكرير وتنميه حقول البترول والغاز ومصانع البتروكيماويات وخطوط الانابيب وكذا مشروعات البنيه الاساسيه كما تقوم الشركة بأعمال تصنيع الهياكل المعدنية والمعدات الاستاتيكيه والمنصات البحرية بالاضافه إلى تغليف المواسير البرية والبحرية.

تلتزم الشركه التزام كامل بمبادئ والتزامات السلامة والصحة المهنية والأداء البيئي التي تشكل الإطار العام للعمل وتفي بمتطلبات الاداره العليا والعاملين ومقاولى الباطن والمجتمع مع تطبيق نظم إدارة متكاملة للسلامة والصحة المهنية وحماية البيئة بما يؤدى إلى التحسين والتطوير المستمر للأداء في إطـار من التنميه المستدامه.

ويتحقق ذلك من خلال:-

- الالتزام الكامل من الاداره العليا بمنع الاصابات والأمراض المهنيه والتطوير والتحسين المستمر لأداء السلامه والصحة المهنية وحماية البيئة.
- الالتزام الكامل بالمواصفات القياسيه القوميه والعالمية وكافه القوانين والتشريعات والمتطلبات الأخرى المرتبطة بمجال العمل لضمان تجنب وتقليل ومراقبه العناصر التي قد تؤثر على السلامه والصحة المهنيه والبيئه بغرض منع الضرر.
- وضع أهداف إيجابيه وتوفير بيئه عمل مناسبه مع مراجعه تلك الاهداف لتحسين أداء السلامه والصحة المهنيه وحماية البيئه.
- مراجعه السياسة دورياً وكلما دعت الحاجة للتأكد من مناسبتها وطبيعة عمل بـتروجـت.
- الاستخدام الأمثل للموارد والمعدات مع تطبيق أحدث الاساليب التكنولوجيه الحديثه لمواكبه التقدم في مجال العمل بما يؤدى إلى التحسين والتطوير لأساليب العمل وتقليل الفاقد في إطار من التنميه المستدامه.
- الاهتمام بتدريب وتوعيه العاملين لتنميه مهاراتهم الشخصيه في أداء الاعمال ونشر الوعى الخاص بالسلامة والصحة المهنية وحماية البيئه.
- التحقيق في كل الحوادث والإصابات والمخاطر الكامنه لإستخلاص الاسباب الجذريه ضماناً لعدم التكرار.

(هذه السياسه معلنه و مفهومه لجميع العاملين بشركه بتروجت و مقاولى الباطن و متاحه للعامه)

M. Shimy

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Chairman and CEO

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1. Traffic and Vehicle Safety

PJ – HSEMSP 4.4.6.7

1.1 Introduction

A large number of vehicles, trucks and buses travel everyday on the roads carrying Petrojet employees, contractors, sub-contractors and materials toward the Working areas and on the public roads. Therefore driving is identified as one of the most dangerous work activities carried out within Petrojet Operations that could result in a multiple fatalities and loss of assets.

1.2 Objective

The objective of this Driving Safety Practice is to ensure the managing of driving risks formally to reduce the number and frequency of driving related accidents and improve the driving safety performance by assurance for the competency of the drivers and the integrity of the vehicles.

1.3 Applicability

This practice should be applied across all Petrojet sites and activities, involves transporting of goods; materials and/or people.

Therefore; this Practice will apply to:

a. All Petrojet employees driving any kind of vehicle related to the business.
b. All Petrojet Vehicles and Drivers.
c. All Contractors working with / through Petrojet premises or within Petrojet operational control.
d. All sub-contractor drivers including catering, logistic…etc.

1.4 Responsibilities

II. AREA MANAGER

a. Fully committed to this Driving safety Practice.
b. Ensure this practice is implemented well within the Site.
c. Approve trips involving emergency and night driving.
d. Ensure a proper securing for the Site gates to control access and exit to the Site.

III. TRANSPORTATION DEPARTMENT

a. Develop and Implement a preventive maintenance schedule for all Petrojet vehicles
b. Demonstrate a documented evidence of vehicles maintenance and driver's trainings.
c. Control and issue Petrojet the driving permit within the working area.
d. Reporting of vehicle/bus accident.
e. Ensure all Transportation Contract and hired vehicles comply with Petrojet Driving Safety Practice.

IV. HSE DEPARTMENT

a. Review and approve driver training programs
b. Determine and communicate the Site speed limits to all departments

c. Monitoring / Audit Petrojet and Contractors drivers' behavior.

V. THE PROJECT MANAGERS

a. Randomly check / monitoring the traffic inside the Site to ensure the commitment of the Site managers to the safe driving policy.

b. Take the necessary disciplinary action toward the violated drivers.

1.5 Vehicle Safety Requirements:

- ✓ All vehicles shall be fit for the purpose, and shall be maintained in safe working order, with individual seat belts installed and functional.
- ✓ All vehicles should be equipped with first aid kid, fire extinguishers, emergency reflective triangles, tools and spare tire in good condition.
- ✓ The number of passengers shall not exceed the manufacturer's specification for the vehicle.
- ✓ Future purchased vehicles should be fitted with ABS braking system, front passengers airbags.
- ✓ Loads shall be secure and shall not exceed the manufacturer's specification and legal limits for the vehicle.
- ✓ Carrying passenger is not allowed for vehicle that is not originally designed for this intent. (e.g. pickup truck)
- ✓ Luggage and stores compartment separated from passenger area – luggage barrier
- ✓ Motor cycles are not allowed to enter Petrojet Site.

Vehicle Checks

- ✓ Transportation Department Responsibility: Maintain the vehicle periodically in safe working order by developing a preventive maintenance program.
- ✓ The Driver responsibility to monitor his vehicle on a daily basis; the following checks are mandatory for all drivers of vehicle Checks
- ✓ Seat belts are in good condition and function properly.
- ✓ Ensure a fire extinguisher, spare tires, jack and hand tools are situated within the vehicle and secured / fitted with a bracket.
- ✓ Ensure the tires are in good conditions.
- ✓ Ensure the tire pressure is adequate.
- ✓ Check/Ensure the lights and indicators are function.
- ✓ Check windscreen visibility and ensure that, the wipers & washers are function.
- ✓ Ensure that, the horn is working.
- ✓ Check and adjust the mirrors to give wide rear view.
- ✓ Check the radiator cooling fluid level.
- ✓ Check the engine lubricant oil level.

- ✓ Ensure that; the fire extinguisher and the warning reflector triangle are attached within the storage area.

For Heavy Vehicle

- ✓ Conduct the above checks in addition to the following:
- ✓ Ensure the vehicle equipped with chock blocks.
- ✓ Drain the condensate water from air tank.
- ✓ Check air hose coupling connections
- ✓ Check oil & air pressure levels
- ✓ Check air brakes

For Buses

Conduct the above checks in addition to the following:

- ✓ Inspect the seat belts.
- ✓ Inspect the seat conditions.
- ✓ Check the bus compartments.
- ✓ Check the bus closing door devices.
- ✓ Drivers to use the inspection form every shift and to report any deviation to the Transportation Department; (Appendix #1).

The Site Gate Check

Check point to be available at the Site gates to control the vehicles travelling entering/exiting and the following check's to be carried out:

- ✓ Driver valid Driving license.
- ✓ Valid Vehicle license.
- ✓ All passengers are wearing seat belts
- ✓ If a truck is carrying radioactive source, it must be labeled and the source container locked The driver must have approved radioactive transfer permit and adequate communication device, Example; mobile
- ✓ If a truck is carrying loads, the loads must be secured correctly.
- ✓ In case of access into hazardous areas a Hazardous Area Entry Permit must be issued.

1.6 Driving Safely Ground Rules

All drivers within Petrojet Sites to be fully committed with the following Driving safely Ground Rules:

- ➢ The drivers not allowed to drive within Petrojet facilities unless obtaining the Petrojet driving permit.
- ➢ Foreign drivers need to have an Egyptian driving license or International driver's license to drive outside of the Site fence in addition to Petrojet Driving permit.

- Drivers and all passengers must be fastened their seat belt whenever the vehicle is in motion.
- Drivers must comply with the legal traffic rules and the company traffic ground rules.
- The mobile phone usage is prohibited for the drivers while the driving operation.
- Drivers shall not be under the influence of alcohol or drugs, or any other substance or medication that could impair their ability to drive.
- Follow the Site parking rules.
- Drive to comply with the Defensive Driving techniques.

1.7 Required Rests Periods for Drivers

- No driving under tired or fatigue; the drivers to get adequate rest while the driving duties as per below guidelines:
- A minimum of ten minutes rest every two hours driving.
- The total driving period not exceeding 10 hour per day.
- If the journey is estimated to exceed eight hours, then a back up driver is required for that journey.

1.8 Driver Training

All drivers PETROJET; Contractors & Sub-contractors shall have a valid driving license for the class of vehicle being operated.

It is the driver's responsibility to keep their license up-to-date and inform their supervisor of any change in status; expiry; suspended; ..etc.

- Department's Manager to nominate the drivers.
- The attendee to have a valid driving license.
- All Petrojet Drivers; Contractor & Sub-contractor drivers to attend and successfully passing the Defensive Driving Course including a driving practical assessment before allowed to drive for Petrojet.
- All Permitted Drivers shall attend refresher training and assessment every three years.
- Transportation Department to keep the records of driver's attendance with dates and successful completion of trainings.

Professional Drivers

a. Professional drivers are requested to attend the following sessions before driving any company vehicle :

- Defensive Driving Training.
- First Aid Training.
- Fire Extinguisher Usage Training.

b. Complete successfully the practical driving assessment.

c. To be with the required fitness capability screening that relates to their ability to drive safely as part of their recruitment/selection.

d. The professional drivers are responsible to report any change in their functional capability occurs, which affects their ability to drive.

1.9 Driver Medical Assessment

I. *ANNUAL MEDICAL ASSESSMENT FROM CERTIFIED MEDICAL FIRM IS REQUIRED FOR ALL PROFESSIONAL DRIVERS. THE MEDICAL ASSESSMENT TO BE INCLUDE BUT NOT LIMITED THE FOLLOWING:*

a. Assessment of visual acuity, depth perception and visual fields.
b. Assessment of their risk factors for sleep apnea and drug test.
c. Assessment of mobility problems.
d. Assessment of cardiovascular risk (blood pressure, pulse, heart conditions etc).
e. Assessment of any other condition that may interfere permanently or temporarily with the individual being able to control the vehicle.

II. *THE RESULTS OF THE PERIODICAL MEDICAL ASSESSMENT OF DRIVER'S TO BE MAINTAINED ANDAVAILABLE AT THE MEDICAL DEPARTMENT*

1.10 Towing of Vehicle

I. Competent personnel only allowed towing other vehicles.

II. Competent person meaning; the person well trained in the proper method of towing and understanding the associated hazards and risks.

III. The towed vehicles must be fitted with certified rigid towing fitments.

IV. Equipment being towed must have its own independent braking system.

V. Towing must be within the field areas only.

VI. The towing speed not exceeding 45 km/h.

VII. The towing equipment to be equipped with flashing indicators and brake lights powered by the towing vehicle.

VIII. The towed vehicle must be lighter than the towing vehicle.

1.11 Driving at Night

Restrict the driving at night on the public roads; outside the Site fence, the following are examples of exceptions:

Responding to emergency case.

Urgent Business need with prior written approval with a risk assessment to be obtained from the Project Manager or his delegated authority or HSE MGR.

1.12 Petrojet Traffic Violation System

Applying fair traffic violation system across Petrojet in case of any traffic violation resulted from the company drivers, contractors and sub-contractors drivers. The following guidelines to be applied:

I. Issue a written warning for a first time driver violation.
II. Suspend the driving license for period not less than one month for the second violation.
III. Suspend the driving permit for period not less than six month and consider suitable penalty action in accordance with Petrojet rules and complying with Egyptian Labor law for the third time violation.
IV. To allow any offender to drive again on completion of suspension, he must attend and pass the defensive driving course and assessment.
V. Charge the cost of loss/damage of the accident to the involved driver.

1.13 Road Accidents Reporting

I. The driver is responsible to report any vehicle accident immediately to the Site HSE Department and Security Department.
II. In case of the vehicle accident occurred outside the Site fence, "On the public the driver requested to not move the vehicle until notifying the local traffic police authority and immediately notify the emergency number of his work location.
III. All vehicle accident must be reported and investigated

Traffic and Vehicle Safety

1.14 Journey Management Plan (JMP)

I. Scope:

The journey management plan to be implemented in the following cases:

a. Journeys From / To Egyptian cities - Petrojet Site.
b. Approved Night driving journeys

II. Plan the Journey

a. Transportation Department with the traveler to complete the journey management plan as per (Appendix 3).
b. Prior to the journey; the vehicle to be inspected and fit for purpose according to the journey checklist.
c. The loading check list to be signed for the loaded vehicle journey.
d. Valid Vehicle driving license for vehicle and driver and to be available within the journey.
e. Cargo manifest to be kept with the loaded load.
f. Transportation Department to review with the driver the journey.
g. Hazardous and assessing the risks.

h. The driver to be familiar with the transported hazardous materials and the required actions in case of accident.

i. The journey management plane to be singed from all concerned parties.

j. Record / kept a register for the journey trip

III. During the journey

The Driver Responsible to comply with the following:

- Drivers to follow the agreed route for the journey plan.
- Drivers to comply with the traffic road speed limits and warning signs.
- Drivers prohibited using a mobile phone while driving.
- The drivers responsible to ensure the fasten of the seat belt for himself and the carried passengers.
- Drivers to follow the rest time as mentioned in the journey plan.
- Prohibited to carry unknown passengers.

IV. Journey Follow Up

a. During the journey; the driver to be in communication with the Transportation department supervisor.

b. The driver to report immediately any unexpected issue or problems during the journey.

c. In case of emergency during the journey; Transportation Department Manager to notify the Emergency Response Team.

V. Closing the Journey Plan

a. By the end of the journey; the driver to contact the transportation department supervisor to close the journey registration

1.15 Assurance Of Compliance

To ensure that all Petrojet drivers / passengers and the contractor drivers / passengers are committed and in compliance with the driving safety practice; the following requirements to be managed:

- The Site Managers to conduct random compliance checks.
- Security Department to conduct seatbelt and driver license checks at security gates and conducting a randomly traffic complain within the Site.
- HSE Department to conducting a random audit and traffic campaign within the Site.

2. Personal Protective Equipment

PJ – HSEMSP 4.4.6.3

2.1 Introduction

To ensure the health and safety of personnel; (PPE) Personal Protective Equipment may be required to be worn.

PPE is the last defensive line of protection against workplace hazards.

The basic requirements for the use of Personal Protective Equipments (PPE) are describes in this practice as following:

2.2 Objectives

The objectives of PPE procedure are:-

- Set the minimum requirements for PPE.
- Define when and where additional types of PPE required to be worn
- Define the responsibilities to ensuring the availability of the proper and adequate PPE and compliance with this procedure

2.3 Responsibilities

All persons in a supervisory role and managers have the responsibility to ensure their workforce understands well and fully comply with this procedure. They have the responsibility for ensuring PPE are available to their staff as required and replaced whenever necessary.

2.4 General

4.1) All personal Protective equipment (PPE) furnished by the Company for the use of employees will be of the safest design and construction available for the hazard involved.

4.2) Supervision will see that all personal protective equipment is maintained in the safest and most sanitary condition possible.

4.3) Employees cooperation is essential if personal protective equipment is to provide the protection for which it is designed.

4.4) It must be worn properly and the employee must be trained in its use.

4.5) It must not be abused

4.6) It must be maintained in good condition by the assigned employee.

4.7) It must be returned to the supervisor for repair or replacement if it is defective or damaged.

2.5 Application

This procedure applies to all personnel within any working area.

2.6 Minimum Requirements

The minimum requirements for PPE for all personnel to whom this Procedure applies are:-

- A hard hat
- Safety shoes or boots with steel toecaps
- Eye protection comprising toughened lenses and side shields

- Long Sleeve Coverall during the Construction mode.
- Short Sleeve Coverall during Lathe works.
- PVC Aprons for Chemicals Handling.
- Adequate Gloves.

2.7 Eye and Face Protection

It is the responsibility of the employee and supervisors to ensure the adequate protective equipment is worn properly whenever an eye and / or face hazard exists.

SAFETY GLASSES TO BE IN COMPLIANCE WITH BS EN 1661F, ANSI Z87.1/CSA Z84.3, OR AN EQUIVALENT STANDARD

Contact lenses are not permitted, except for office workers, all persons who wear contact lenses are required to wear chemical splash goggles as minimum eye protection in all areas where there are chemical or dust exposure.

Spectacle-type Safety Glasses provide frontal protection only, from light impact and when required, from glare and injurious radiations. In the following operations, face shields should also be used in conjunction with safety glasses.

- Machining and drilling
- Using striking tools: hammer, hatchet, axe, sledge,...etc
- Cutting and splicing wire rope.
- Light grinder
- Glass breaking

Spectacle-type Safety Glass with side shields provide side protection as well as frontal protection and shall be worn as minimum protection whenever the hazard is not directly in front of worker.

Plastic Goggles- one piece, moulded plastic- headband style only, are approved to be worn for much the same protection as spectacle-type safety glasses with side shields.

Goggles – generally used as a substitute for spectacles where there is a need for more substantial protection from flying particles and liquids. They may also be used comfortably over conventional prescription spectacles

Face Shields offer substantial eye protection as well as full face protection and are especially suited to grinding and handling corrosive chemicals.

Cutting/welding eye protection – specialist protection which is suited to shielding from the UV light generated in this work

2.8 Hearing Protection

Continued exposure to high sound levels may be injurious to the hearing of personnel. Hearing protection devices are therefore required to be worn by all employees whose noise exposure equals or exceeds a specific criterion level.

Hearing protection in designated areas should conform to ANSI S3.14 or an equivalent standard. Ear Muff conforms to EN 352/1 and Ear plug conforms to EN 352/1

The use o hearing protective devices is required for all affected employees whenever the exposure rate is at or above 90 dBA for eight hours working day.

2.9 Head Protection

Hard hats/ helmets are used for head protection, should meet the specifications To BS EN 397, ANSI Z89.1 (Impact Protection), and ANSI Z89.2 (Electrical Protection) which are OSHA requirements or an equivalent standard.

It will be furnished to all applicable employees together with instructions telling when and where to wear them.

2.10 Respiratory System

Respirator Protective Devices vary in design, application and protective capability
A supervisor must therefore assess the inhalation hazard and understand the specific use and limitations of available equipment to assure proper selection.
Respiratory protective devices fall into three general classes: Air – purifying, Supplied Air and Self-Contained Breathing Apparatus.

RESPIRATORY PROTECTION SYSTEM; FIT CHECK MUST BE UNDERTAKEN EVERY TIME BY THE USER.

FILTER RESPIRATORS PROVIDE PROTECTION AGAINST RELATIVELY LOW TOXIC CONCENTRATIONS AND RANGE FROM DISPOSABLE DUST MASKS TO HIGH PERFORMANCE FULL FACE MASKS ARE USED TO PROTECT AGAINST DUST, ORGANIC VAPOUR AND ACID GAS.

2.11 Hand Protection

Conventional work gloves will be provided by the employee and should be worn when performing normal field or plant work.

SAFETY GLOVES FOR GENERAL USE SHOULD CONFORM TO BS EN 240 OR AN EQUIVALENT STANDARD.

Electrical Isolation gloves should conform to BS EN 60903 or an equivalent standard.
Gloves should not be worn in operations where the glove might be caught and pull the hand into a damaging situation.
Gloves should be kept reasonably free of grease or oil and should be discarded when they became badly worn.
Suitable gloves to protect employees' hands from acids, (chemicals) &solvents (should conform to EN 374 & EN 388)and electrical hazards will be furnished by the company.
Gloves furnished for liquid protection must not be used for electrical hazards.
Gloves furnished for electrical work hazards must not be used for liquid protection.
Appropriate gloves should be worn during all manual work including such work as welding, cutting, grinding(should conform to EN 388, EN 407 & EN 12477) handling rough or oily objects, and handling slings(should conform to EN 388)

2.12 Foot Protection

It is recommended and required in some regions that all employees who work in field operations provide and wear safety shoes in good conditions.
Safety footwear should conform to BS EN 345, or ANSI I/75 C/75, or an equivalent.

SAFETY FOOTWEAR TO PROTECT FOOT AND ANKLES FROM DAMAGE BY IMPACT, SCUFFING, AND CRUSHING (TOES).
THE SOLES OF THE BOOT SHOULD PREVENT SLIPPING ON WET OR OILY SURFACES.
FOOTWEAR SHOULD HAVE A HEEL AND NOT A SMOOTH SOLE.
STEEL TOE RUBBER SAFETY BOOT WHICH IS OIL RESISTANT ANTI-ALKALI AND ACID, ABRASION-RESISTANT SHOULD CONFORM TO EN I SO 20345.
When, in the judgment of the supervisor, metatarsal foot guards are necessary, such guards will be furnished by the company and must be worn by the employee

2.13 Fall Protection

A full body harness type of fall protection should be EN 358 & EN361.

A full body harness type of fall protection should be used whenever working in a position where a fall from a height of more than 2 meters is possible.
Safety harness must be worn whenever an altitude hazard exists.
When the harness is worn, it is to be supported independently of the platform, scaffold or object from which the man is working.
The lifeline/lanyards must be protected from cutting or pinching and must not be led over a sharp edge.
In hot work operations or those involving the use of acids, solvents or caustics, lifelines and lanyards must be kept clear to avoid burning or damage.
The safety harness and its lanyards must be inspected before each use. If found it worn or damaged in any way, they shall be tagged "DO NOT USE" until they are repaired or replaced.

2.14 Additional Requirements

Some tasks and locations will require additional types of PPE to be worn.
This might be defined on a permit, required by procedure, or simply derecognized good practice.

3. Control of Work System

PJ – HSEMSP 4.4.6.2

3.1 PetroJet Control of work Policy.

This policy statement and activities govern the planning and management of work at all PETROJET facilities, this policy is implemented through the PETROJET safe system of work (SSOW) practices and client's permit to work system equivalent whenever the works are contracted in certain circumstance premises.

Adherence to this policy is mandatory. Any Deliberate non conformance will lead to disciplinary action.

Our goals are simply stated:
"No accidents, No harm to people, and No damage to the environment"
Everyone has the obligation to STOP unsafe work and report any incidents how small it is to his/her line management for further investigation and lesson learned.

Control of Work encompasses defining clear roles, responsibilities and accountabilities for planning, risk assessing, authorizing, executing work, inclusive of performance assurance and improvement.

All work in PETROJET Operations & facilities will:

- Follow the PETROJET Safe System of Work (SSOW) written practices.
- Have accountabilities defined for all roles involved in the work.
- Be carried out by appropriately trained and competent personnel.
- Be planned and scheduled taking account of interactions of individual tasks.
- Be subject to a permit where work is governed by the golden safety roles and or SSOW CoW practice.
- Be covered by a risk assessment which identifies the scope, hazards, controls and mitigations for risk involved, which I communicated, accepted and signed by those involved.
- Be monitored and managed by a responsible person.
- Be controlled to ensure all work sites are left in a safe condition on completion or interruption of work activities.
- Be subject to a program of continuous improvement by regular auditing and periodic management system review, taking account of internal & external lessons learned.

Work in the PETROJET Operations & facilities will NOT be conducted unless:

- It has been pre-job risk assessed; the risks have been managed to an acceptable level.
- The required resources as defined in manning directive are available, trained and competent to carry out and supervise the work safely and efficiently.
- It is covered by an approved standard operating procedure (SOP), or a permit to work (PTW).
- The emergency response appropriate to the level of its potential hazards and risks are in place.

3.2 Introduction

3.2.1 This document describes PETROJET's paper based Control of Work (COW) practice, namely the permit to work system, task risk assessment and isolation control.

3.2.2 This practice should be applied consistently across all the PETROJET activities, where there is a requirement for local rules covering site specific organizational, logistical and administrative arrangements, the local rules need to be approved by Cairo to ensure that they do not deviate from core processes described in this practice.

3.3 Control Of Work

3.3.1 A permit to work system will be used to approve work to proceed subject to specific controls and checks which will ensure the safety of personnel involved, the protection of the environment and the prevention of damage to PETROJET assets and production. A work permit must:

3.3.1.1 Define the scope of work, location and its duration clearly and specifically,
3.3.1.2 Identify hazards and reference risk assessments.
3.3.1.3 Identify isolation of energy sources required to carry out the job.
3.3.1.4 Establish control measures to eliminate or mitigate risks.
3.3.1.5 Link the work to other associated work permits, simultaneous operations, ICC,…etc
3.3.1.6 Ensure that where there are isolations common to more than one permit, the isolations are not removed before all permits have been signed off.
3.3.1.7 Specify those carrying out the work and verify that the risks and control measures have been communicated to them.
3.3.1.8 Be authorized, monitored and re-validated by the Site Controller or Area Authority (AA).
3.3.1.9 Ensures adequate control over the return to normal operations.

3.3.2 Non Permitted Activities

3.3.2.1 Certain activities do not normally need to be covered by a permit. Any task that does not have a permit must have a risk assessment and a written procedure. Non permitted activities include the following:

3.3.3 Use of the following tools and equipment inside accommodation areas, workshops, control rooms and other non-hazardous modules:
3.3.3.1 Battery-operated cameras
3.3.3.2 Processes involving naked flames or hazardous substances in approved laboratories

3.3.4 Visual inspection of areas (except confined space)

3.3.5 Operation of equipment for approved training purposes e.g. use of firefighting or lifesaving appliances during drills

3.3.6 The handling and use of non-hazardous materials
Work of a cold nature (i.e. machining, fitting, turning and calibration work) in workshops in non-hazardous zones, see Appendix 1 for definition of hazardous zones

3.4 Permitted Activities

3.4.1 A permit is required whenever work is planned which, if not properly controlled, would present a significant risk. Activities which require a permit include:
3.4.2 Work where sources of ignition are or may be generated in an area where hydrocarbons may occur
3.4.3 Breaking containment
3.4.4 Work involving health hazards e.g. chemicals, radiation, noise, sand blasting

3.4.5 Working at heights
3.4.6 All work directly over the sea (Over-side Work)
3.4.7 Excavations/ ground disturbance
3.4.8 Confined space entry
3.4.9 Work on systems which contain energy e.g. electrical systems, pressurized systems
3.4.10 Where separate tasks which may interact are involved.

3.5 Types of Permit

3.5.1 There are **Five (5)** categories of Work Permit, as follows:

3.5.1.1 Hot-Cold Permit
3.5.1.2 Work At Height Permit
3.5.1.3 Excavation Permit
3.5.1.4 Radiography Device Permit
3.5.1.5 Vessel &Confined Space Entry Permit

3.5.2 Distribution

Permits are printed in quadruplet, original plus 3 copies. Distribution of permit copies once completed is described below

3.5.2.1 Original - Retained by Performing Authority (PA) and displayed at the work site
3.5.2.2 Copy 1 - Registered and retained by Safety or as determined by local rule
3.5.2.3 Copy 2 - Retained by Area Authority (AA) and displayed in a prominent location at a designated location/permit board as an active permit.
3.5.2.4 Copy 3 - Issued to third parties, e.g. Affected Area Authority or other interested parties. If not required, retained with Copy 2.

3.5.3 Permit Hierarchy

The main activities covered by each permit category are detailed below.

3.5.3.1 Hot-Cold Permit

A hot work permit is required to control work when using a naked (open) flame. A hot work permit – Spark Potential is required for work where sparking or arcing can occur. Appendix 1 lists typical hot work – spark potential activities.

3.5.3.2 cold work permit

Is required to controlactivities that may be hazardous. All other activities are covered below.Appendix 1 lists typical Cold Work activities.

3.5.3.3 Excavation Permit

An Excavation permit is required for every man made cut, cavity, trench or depression in the ground. Entry into a trench to repair a hydrocarbon line may also require a confined space entry and hot work permits. Guidelines on trenching and excavation activities are covered in PETROJET HSE Practice – Ground Disturbance

3.5.3.4 Vessel & Confined Space Entry

A Confined Space Entry permits is required whenever a person must enter a poorly ventilated area, which includes: work on top of a floating tank roof, vessel or excavation of 4 feet (1.2 m) or more in depth, entry into a tank or vessel for inspection or repair, etc.. Any work within a confined space, including inspection, must be carried out under a Confined Space Entry permit. Gas testing for a Confined Space Entry Permit must be done by an Authorized Gas Tester (AGT). Guidelines on confined space entry are covered in PETROJET HSE Practice - Confined Space Entry.

3.5.4 Authorization and Validity Periods of Permits

3.5.4.1 All permits will be approved by the Site Responsible Person on a daily basis up to a maximum of 7 consecutive days, after which the permit will be rewritten and issued. The Site Responsible Person will complete the boxes on the permit, "valid from … to …"

3.5.4.2 A permit is valid for 1 shift up to 12 hours. Whenever the AA or PA changes (leaves his shift), the permit must be re-authorized. For continuous work, the permit may be re-authorized at every shift change. For non-continuous work longer than 7 days, the permit must be cancelled, collected, held, and re-issued. Re-authorization involves the AA confirming that the risks, precautions and work site conditions remain unchanged, communicating this with the PA following a site inspection, and obtaining required signatures

3.5.4.3 A copy of all permits, associated certificates and registers for isolations and overrides in force must be held at a suitable location, e.g. control or site office.

3.5.5 Supplementary Certificates and Associated Documents

3.5.5.1 Supplementary certificates and documents are required where activities have to be performed before a permit can be used. Typical examples are:

3.5.5.1.1 Isolation Confirmation Certificate (ICC)
3.5.5.1.2 Lifting Plan
3.5.5.1.3 Leak test
3.5.5.1.4 Material Safety Data Sheet (MSDS)
3.5.5.1.5 Overrides (e.g. fire, gas, Emergency Shut Down (ESD))

3.5.5.2 Provision is made for cross–referencing the Permits, supplementary certifications and other associated documents.

3.5.6 Registers

The following registers are mandatory.

3.5.6.1 Permit Registre
3.5.6.2 Isolation Confirmation Certificats

3.5.6.3 Level 2 Risk Assessments
3.5.6.4 Long Term Isolations
3.5.6.5 Overrides (Fire & Gas, ESD)
3.5.6.6 Breaking of Containment
3.5.6.7 Registers of Authorized persons (e.g. AA, PA, Isolation, Gas Tester, Electrical Resp. Person)

3.6 Responsibilities

The key functions within the COW process are described in this section. While every effort should be made to maintain consistency of responsibility between Districts, it is recognized that the exact role and existence of some positions will vary. Where this is the case, the key functions described below should be incorporated within the equivalent roles for that District.

Each District should develop a PTWauthorized personnel

3.6.1 PETROJET Cairo Leadership Team

3.6.1.1 Ensuring the CoW practice is applied at sites within their area of responsibility.
3.6.1.2 Ensuring periodic self-regulatory review and/or audit of the operation of the CoW is carried out.

3.6.2 Project or Site Manager

The project or Site Manager is responsible for:

3.6.2.1 Delivery and performance of the Cow process
3.6.2.2 Ensuring the Cow process applied at the District/site is authorized by them prior to implementation
3.6.2.3 Ensuring that:
3.6.2.3.1 A controlled register of all authorisedCoW personnel, namely the Area Authority (AA), Performing Authority (PA), Isolating Authority (IA) and Authorized Gas Tester (AGT) is maintained.
3.6.2.3.2 The training and competency standards, as defined in this document, are followed
3.6.2.3.3 The Cow process is subject to regular monitoring and auditing, acting upon the results of these audits to maintain the integrity of the system and proposing recommendations for system improvement

3.6.3 Area Authority

The Area Authority (AA) is the central figure in the day-to-day management of the Cow process within their area of responsibility. There may be more than one AA on a particular

site. For offshore and remote site work, some of the AA responsibilities may be delegated to a competent, nominated person and followed up by radio communication to the AA before work proceeds. The duties of the AA are:

3.6.3.1 Overall responsibility to the Project Manager for the safe control of work activities in accordance with these procedures within their area. This includes the issue of all work control permits and certificates.

3.6.3.2 Liaising closely with the Performing Authority when planning permits and certificates to ensure all the appropriate hazards and controls have been identified for that task

3.6.3.3 Ensuring that the appropriate level of risk assessment has been carried out for the task

3.6.3.4 Approval of isolation design, control of isolation implementation and ensuring that the isolation is in place prior to allowing an associated permit to be issued. Also ensuring that the isolation is properly removed after completion of the permit.

3.6.3.5 Ensuring that all the appropriate control measures have been put in place prior to allowing a permit to be issued.

3.6.3.6 Confirming that the PA fully understands the scope of the task and that other members of the work party have been fully briefed via a safety Toolbox Talk (TBT)

3.6.3.7 Application and sanction of trip overrides and reinstatement of sections of the fire and gas detection or protection systems in support of work control activities.

3.6.3.8 Controlling the return of hardcopy permits at the end of each shift

3.6.3.9 Ensuring cancelled permit to work documents are replaced by new ones

3.6.3.10 Maintaining all registers.

3.6.3.11 Ensuring worksite inspections are carried out before, during and after the performance of each task (some of this may be delegated to a competent nominated person

3.6.3.12 Ensuring that adequate handovers take place at shift change, crew change or other change out of AAs, PAs and IAs

3.6.3.13 Validate lessons learned and audits

3.6.3.14 Stopping unsafe work

3.6.4 Affected Area Authority

This applies where there is more than one AA on a site or where activities carried out in one area impinge or impact on activities in another area (e.g. Simultaneous Operations (SIMOP), such as maintenance).

3.6.4.1 With the AA and persons responsible for activities in another area, countersign the permit from the adjoining area to confirm that he isaware of the activity taking place and that the hazards can be effectively managed with the specified controls

3.6.4.2 Be aware about duration and types of all isolations affecting the work area and the area under his responsibility

3.6.4.3 Communicate with personnel working within his area who may be affected by the adjacent activity to ensure that they understand the potential impact on their activities

3.6.5 Site Responsible Person

3.6.6 Performing Authority (PA)

The Performing Authority (PA) is the responsible person for the activity being carried out under the permit. The PA may be the person carrying out the task or may be supervising a group of people carrying out the job. The PA's main duties are:

3.6.6.1 Creating the Permit and identifying the hazards and control measures (Level 1 Risk Assessment) for the task being planned

3.6.6.2 Participating in any Level 2 Risk Assessment for the planned activity where required

3.6.6.3 Ensuring that where other persons are involved in the task, they fully understand the scope of the work and the hazards and controls for the job by holding a pre-job safety toolbox meeting. This includes ensuring all the work party sign off the worksite hard copy of the permit.

3.6.6.4 Ensuring supplementary controls are applied

3.6.6.5 Ensuring that only work covered within the scope of the permit takes place

3.6.6.6 Ensuring that lessons learned from the job are captured

3.6.6.7 Ensuring that the worksite is kept in a clean and safe condition both during and upon completion of the job

3.6.6.8 Ensuring adequate handovers take place at shift and crew change periods with the oncoming PA

3.6.6.9 Reports and interacts with the AA and AAA on any Management of Change (MOC) issues to ensure the risks from all hazards are mitigated to as low as reasonably practicable

3.6.6.10 Stopping unsafe work

Note: The same person cannot act as Performing Authority and Area Authority for the same task

3.6.7 Authorized Gas Tester

3.6.7.1 Authorized Gas Testers (AGT) are authorized to test for the presence of flammable vapors, toxic gases and oxygen as required in support of Hot Work or Confined Space Entry permits.

3.6.8 Isolating Authority

The Isolating Authority (IA) is responsible for isolating specific sections of plant or items of equipment to the highest quality and security of isolation which is reasonably practicable. The IA is also responsible for demonstrating the integrity of the isolation to the AA and PA and for monitoring the integrity of isolations whilst they are in force and ensure the removal of isolations when the job is complete and prior to equipment start up . The IA shall also witness the insertion of spades to achieve positive isolation when required.

3.6.9 Responsible Electrical Person

The Responsible Electrical Person (REP) is responsible for having a clear overview of all the electrical work being carried out. The REP will approve any high voltage work, switching programs, ensure that any equipment that has

multiple sources of electric power is identified and properly locked out, countersign permits with electrical content where the AA is not electrically competent and ensuring that the isolation has been correctly designed.

3.6.10 Site Safety Supervisor

The Safety Supervisor responsibilities include:

3.6.10.1 Supporting the operation in the effective implementation of the Cow
3.6.10.2 Monitoring compliance with this Cow practice
3.6.10.3 Sign permits in accordance with Egyptian regulations (Labour Law)

3.7 Training and Competency

All personnel involved in Cow must be trained as illustrated in Table 1. District HSE is responsible for ensuring delivery of the training.

Table 1 Prerequisite Training Requirements (before appointment)

Table 1 represents core Cow competencies. Cow refresher training frequency be annual

The Project Manager appoints persons who authorize the AA, PA, IA and AGT as competent to carry out their duties and maintain a Register of all authorized personnel

3.8 Permitting Process

The following sub-sections describe the key activities involved in the permitting process. Appendix 2 illustrates the sequence of events in compiling a typical permit to work.

3.8.1 Work Packs

3.8.1.1 A permit itself is not a control for a task, it is a means of recording the controls required and why they are required. Work must be performed within the permit to work system against an approved Work Pack containing procedures, appropriate risk assessment and supplementary documentation such as lifting plans, isolation plans, hot work challenge, and rescue plan as required. The PA shall develop the work packs.

3.8.1.2 All work packs shall be approved by a Senior Manager to be determined locally.

3.8.2 Work Control and Planning Meeting

A work control and planning meeting shall be scheduled for the latter part of the dayshift. The exact timing, attendance and format will depend on the site. The meeting shall be the main forum for:

3.8.2.1 Reviewing ongoing activities and discussing all aspects of tasks
3.8.2.2 Approving newly raised permits for the following day as permits should be requested 24 hours in advance.

3.8.2.3 Identification of interactions between work sites (use of plot plans), e.g. SIMOPS
3.8.2.4 Discussing limitations to the work that is in progress based on:
3.8.2.5 Type and volume of work
3.8.2.6 Activity levels limited to levels which can be safety managed by the OIM / Site controller and Area Authorities.
3.8.2.7 Competencies and experience of permitting authorities.
3.8.2.8 Ongoing permits, and those newly applied for, should be held at a suitable designated location, e.g. control room or site office, and displayed on a plot plan of the site or Installation so that interactions are apparent. All permits should be already verified by the AA prior to this meeting. Attendance at this meeting will include site responsible person, AA, Operations and Maintenance.
3.8.2.9 Emphasis is therefore placed on raising permits well ahead of time so that they can be reviewed and approved at the meeting.
3.8.2.10 A Log book should be used to record which permits have been issued. This record should include the type of permit, its number, any related isolation certificates, the nature of the work and the work area.

3.8.3 Permit Issue

3.8.3.1 Before the permit is issued the AA will walk out the work area/site with the PA and Safety Supervisor to ensure and confirm all permit requirements have been fulfilled and identify any material changes which could impact the risks assessment. On unmanned platforms and remote sites, this may be delegated to an authorized person, who will communicate, by radio, with the AA before the work begins. When issuing the permit the AA will:
3.8.3.2 Ensure all supplementary permits/ certificates and other precautions are confirmed in writing and referenced on the permit.
3.8.3.3 The following approval signatures have been obtained:
3.8.3.3.1 Area Authority approval for the work to proceed
3.8.3.3.2 Performing Authority indicate his understanding of the precautions to be followed
3.8.3.3.3 AGT to confirm the validity of any gas test and that he has inspected/re-inspected the work site.
3.8.3.4 Ensure the PA accepts the permit (via face to face discussion at the work site or through the use of radios for remote satellites):
3.8.3.4.1 Understands the scope and requirements of the work permit, adjacent activities/hazards and initial emergency actions.
3.8.3.4.2 Is shown the correct equipment addressed by the permit, which shall be clearly identified.
3.8.3.4.3 Is able to identify when changes in the work environment invalidate the original permit, and shall cease all activity until a re-assessment has been completed.

3.8.4 Permit Acceptance

3.8.4.1.1 When the PA has accepted the permit he/she should assemble the team at the work site and ensure all are aware of the hazards and the precautions to be taken by

means of a toolbox talk. All involved in the task must sign the permit to formally acknowledge that they fully understand its requirements.

3.8.4.2 A copy of the permit must be retained on site for the duration of the work.

3.8.4.3 Operations and any other relevant personnel shall be informed of and understand the impact of the work which may affect them.

3.8.5 Risk Assessments

There are two levels of risk assessment:

3.8.5.1 Level 1 Risk Assessment

Level 1 is a broad overview of the task by Competent Persons (typically the AA and PA) to identify any significant hazards using experience and judgement supported by a hazard checklist and guidelines (e.g. JSA's…etc). Level 1 Risk Assessment is valid for the duration of the task.

3.8.5.2 Level 2 Risk Assessment

Level 2 is a formal semi quantitative assessment which is required when the AA and PA judge that there are greater hazards and complexities associated with the task which require a more rigorous level of assessment. Level 2 risk assessments are done by a team that includes as a minimum the AA, PA, and HSE. It is only valid for the duration of the task. A Level 2 risk assessment is mandatory but not limited to the following activities:

3.8.5.2.1 Confined Space Entry

3.8.5.2.2 Naked flame hot work in all areas

3.8.5.2.3 Failure to meet minimum isolation standards as defined in the PETROJET safety manual.

3.8.5.2.4 Pressure testing

3.8.5.2.5 Complex lifting operations involving multiple suspensions or lifting over live plant

3.8.5.2.6 Breaking containment of systems containing flammable, toxic (e.g. more than 100 ppm H2S), high pressure gas.

3.8.5.2.7 Simultaneous operations.

3.8.6 Isolations and Isolation Certificate

3.8.6.1 Where items of equipment need to be isolated to allow the work to take place safely then an Isolation Confirmation Certificate (ICC) must be raised to control the isolation.

3.8.6.2 The ICC applies to all types of isolation, covering process, control and electrical. The ICC contains a listing of all isolation points and the design must be approved by the AA before it can be applied.

3.8.6.3 Individual isolation points must be signed off by the IA to confirm that they have been put in place. Only on confirmation by the AA that all isolations are in place, can the associated permits be issued.

3.8.6.4 The ICC must remain in force until all permits associated with the ICC have been cancelled.

3.8.6.5 All process and electrical isolations must be designed, implemented and removed in accordance with site practices.

3.8.6.6 **Boundary Isolations**

3.8.6.7 The underpinning principle is "one job/one ICC". This specifically addresses shutdowns and only under the discretion of the site Manager. Where multiple permits are carried out against a common isolation this is termed a boundary isolation. Where boundary isolation is used then each permit must be referenced to the ICC. All the referenced permits must be cancelled before the isolation can be removed.

3.8.6.8 **Long-term Isolations**

Long-term isolations (LTIs) are defined as those isolations that no longer have work performed against them. When an ICC has initially been raised for a task which is complete but the isolation is to be left in place, then the ICC must be moved into long term isolation.

3.8.7 Preparation of Work Site

AA is responsible that the work site is properly prepared, this includes ensuring gas tests are carried out and isolations are in place before a permit is issued. Where an additional paper certificates are used in support of a permit then they should be referenced on the permit and attached in paper form.

3.8.7.1 Gas Testing

3.8.7.1.1 Various work activities will require gas testing to be carried out to ensure that the site is clear of toxic/flammable gases and to reduce the risks associated with work activities.

3.8.7.1.2 There are 2 levels of gas testing – (1) initial testing as required for hot work and confined space entry, which requires a higher level of training and listing the authorized person on a gas tester register; (2) periodic or continuous gas testing done by a "fire watch" or "confined space attendant", which requires less training and the person(s) are not listed on a register. Detailed guidelines on gas testing are provided in the District safety manual.

3.8.7.1.3 Results of all gas/oxygen testing should be recorded on the permit.

3.8.7.2 Overrides Certificate

3.8.7.2.1 For certain types of work safety overrides, such as fire and gas detection system, ESD, high/low alarms, etc., are required as part of maintenance on a system. Any override is subject to an Override Certificate and Register. A record of all overrides must be maintained via a controlled log or register kept in the control room.

3.8.7.2.2 Two registers should be maintained: (1) Short duration overrides, such as for a specific job or task; (2) Long term overrides, such as shutdown of a part of the process/process area and there is no short term plan to start it up. The registers should include details of the following:

3.8.7.2.2.1 Date and time the override was applied

3.8.7.2.2.2 Date and time it was removed

3.8.7.2.2.3 Reason for its application

3.8.7.2.2.4 Name of the person responsible for the override

3.8.7.2.3 Each override should be assessed individually and under no circumstance should an entire zone or area be overridden unnecessarily when override of only a portion of the overrides within the zone or area is required.

3.8.7.2.4 The need for safety system overrides should be recorded on the permit as a control measure. However, it is good working practice to minimize the use and duration of overrides, as the majority of tasks will only require their application for part of the time. For example, a fire and gas detection override may be applied during a breaking of containment task but once containment has been broken and the isolation proved effective, the fire and gas system should be re-armed.

3.8.7.3 Compliance Monitoring

The AA and PA must regularly visit the worksite to ensure that the permit conditions are being followed by the workforce and continually assess whether the original permit still covers the work in progress.

3.8.7.4 Job Completion and Permit Cancellation

When work has been completed, the PA should return the permit to the AA who will arrange for isolations to be lifted. The AA will visit the work site with the PA to confirm the site has been returned to normal before signing to cancel the permit.

Copies of all completed (signed) permits should be retained for 12 months

3.9 Key Operational Guidelines

3.9.1 Policy on Hot Work in Hazardous Areas

Where practical, PETROJET personnel should strive to eliminate naked flame jobs from hazardous areas and reduce hot work as far as reasonably practicable.

Hot Work Challenge should be used for any hot work job. Alternative engineering solutions should always be sought for activities that require hot work. Normally work of this nature should be carried out during planned turnarounds when the plant can be depressurized, drained and made hydrocarbon free.

3.9.2 Actions in the Event of an Unplanned Shutdown

3.9.3 In the event of an unplanned plant shutdown all work is to cease and all permits are considered to be suspended and should be returned to the AA. This should be communicated by an announcement over the public address system, where available, or by other site-specific pre-agreed means.

3.9.3.1 Emergency Actions

3.9.3.1.1 On activation of the site/Installation emergency alarm (except for pre-announced testing activity) all permits are considered to be suspended. Work is to cease and worksites are to be made as safe as is practicable, without risking personal safety, before personnel proceed to their muster point or follow other instructions. Work will not recommence until an instruction to do so has been given.

3.9.3.1.2 In exceptional circumstances a situation may occur where any delay in carrying out emergency work could create a risk to life. In such situations only, the AA may give verbal instruction for work to proceed without a permit being prepared. This decision must take into account any current or unfinished tasks. Where practicable the AA must obtain the agreement of the Site Response Person for such work.

3.9.4 Crew Change/Handover

3.9.4.1 Effective handover between oncoming and off-going personnel at shift handover and crew change is critical to ensure continuity is maintained and that there is no adverse impact on safety.

3.9.4.2 At shift change the off-going and oncoming PA and the off-going and oncoming AA must set aside sufficient time to discuss the work status from both the technical and safety point of view. The permit and its requirements should be reviewed at this time to ensure it is fully understood. The off-going PA may suspend the permit and should leave the worksite in a safe and tidy condition. The oncoming PA will then accept the permit to confirm that they accept the task and the worksite. The AA and PA shall countersign for a permit if taking over the task part way through a shift, e.g. in the event of a crew change. If there is inadequate time to do a permit handover, the permit should be cancelled and re-initiated by the oncoming AA and PA.

3.9.5 Working at night

Managing work at night activities may have different controls and limitations for each area. As a minimum, for night work to be approved by Project Manager the following requirements must be implemented.

3.9.5.1 Obtain approval from the Project Manager

3.9.5.2 Request written permission for night work to be attached to the original work package and permit.

3.9.5.3 Recommendations/Safeguards to be followed

3.9.5.3.1 Pre-job meeting for all crews to understand the work and precautions

3.9.5.3.2 Emergency plans available and discussed.

3.9.5.3.3 Maximum working hours for the crews to not exceed 14 consecutive hours.

3.9.5.3.4 Where possible, use the buddy system.

3.9.5.3.5 The work activities and crews to be managed by the PETROJET AA/PA

3.9.5.3.6 PETROJET AA/PA is physically at the work site during the duration of the work.

3.9.5.3.7 All employees wear proper PPE.
3.9.5.3.8 Lifting gear and slings properly color coded and certified
3.9.5.3.9 Good lighting available to cover the working area and placed in proper position to prevent shadows.
3.9.5.3.10 Housekeeping maintained to prevent fall and trip hazards.
3.9.5.3.11 Follow reporting criteria for incidents and potential hazards.

3.10 Auditing

There are two levels of audit which should be carried out in relation to the Cow:

3.10.1 PETROJET Cairo Audits

PETROJET Cairo shall review the Cow system annually. This system compliance audit should be both field and "document" based, to cover the overall application of the Cow to identify any shortfalls and remedial actions required. The audit team should comprise PETROJET Leadership and cross District representation.

3.10.2 Project Site Audits

Audits of individual tasks covering both the permit and the ICC should be carried out on a regular basis by site personnel, as determined by the Project Manager. Standard formats for permit and ICC audits are included as a reference within Appendix 3 and 4. The audit forms are based on a list of standard questions which are answered with, yes or no or not applicable. The result is scored to give a calculable assessment of the overall quality of the permit or ICC and by recording areas of non-compliance it is possible to identify any trends so that corrective action and appropriate coaching can be carried out

3.11 Appendix 1: Instructions: Place with each Work Pack

AREA AUTHORITY (AA) -- YOUR RESPONSIBILITIES ARE:

- Overall responsibility for the safe control of work activities in accordance with these procedures within their area. This includes the issue of all permits
- Liaising closely with the Performing Authority (PA) when planning permits to ensure all the appropriate hazards and controls have been identified for that task.

- Ensuring that the appropriate level of risk assessment (RA) has been carried out for that task.
- (a) Walking out the job with the PA and (b) ensuring that all the appropriate control measures have been put in place prior to allowing a permit to go live, (c) confirming that the PA fully understands the scope of the task and (d) that other members of the work party have been fully briefed via a Safety toolbox talk.
- Approval of isolation design, control of isolation implementation and ensuring that the isolation is in place prior to allowing an associated permit to go live. Also ensuring that the isolation is properly removed upon completion of the permit.
- Ensuring that the worksite inspections are carried out before, during and after the performance of each task (some of this may be delegated – however, responsibility for ensuring that all work executed within your area is performed safely).
- Has full responsibility for housekeeping in his area and for all work being performed in that area.
- Ensuring that all SIMOPS interactions of any proposed works are identified, the risks are analyzed and work scheduling agreed with the OIM/Area manager at the daily PTW meeting….at it's very basic, no hot work whilst breaking containment etc..
- Patrolling his area and ensure that full compliance with PETROJET safe working practices on all work fronts. If he sees a violation of these practices, then he must stop the work immediately until the problems are addressed.
- Ensuring that adequate face-to-face handovers take place at shift change, crew change and other change out of AA's, PA's and Isolating Authorities (IA)
- Maintaining the Long Term Isolations Register and carrying out audits.

PERFORMING AUTHORITY (PA) -- YOUR RESPONSIBILITIES ARE:

The Performing Authority (PA) is the responsible person for the activity being carried out under the permit. The PA may be the person carrying out the task or may be supervising a group of people carrying out the job

- Initiating the Permit and identifying the hazards and control measures (Level 1 Risk Assessment) for the task being planned.
- Participating in any Level 2 Risk Assessment for the planned activity.
- Ensuring that he understands the work pack for the job and communicates this clearly to his work party at a toolbox talk - he MUST understand and communicate the procedure, risk assessment and mitigations, lifting plans, isolation plans etc., etc. and check their understanding. Toolbox talk to be recorded and all members of the work party to sign off on this to confirm their understanding.
- Ensuring that where other persons are involved in the task, they fully understand the scope of the work and the hazards and controls for the job by (a) walking out the job; (b) holding a pre-

job safety toolbox meeting. This includes ensuring all the work party sign off the worksite hard copy of the permit.

- Ensuring that work controls identified on the permit are fully applied.
- Ensuring that only work covered within the scope of the permit takes place.
- Ensuring that isolations are in place prior to allowing the work crew to begin work.
- Ensuring that lessons learned from the job are communicated to the AA.
- Ensuring that the worksite is kept in a clean and safe condition both during and upon completion of the job.
- Ensuring adequate face-to-face handovers take place at shift and crew change periods with the oncoming PA.
- Reports and interacts with the AA and AAA on any Management of Change (MOC) issues to ensure the risks from all hazards are mitigated to as low as reasonably practicable.
- Responsible for ensuring that he and his team fully comply with PETROJET safe working practices AT ALL TIMES. If this is not possible for any reason, or sees a violation of these practices, then he must stop the work immediately until the problems can be addressed.
- Stopping unsafe work.
- Empowering the work crew to stop unsafe work.

3.12 Appendix 2: List of Activities that require a Hot Work/Cold Work Permit.

List of Activities that require a Hot Work Permit

A hot work permit is required to control work in areas where hydrocarbons or other flammable materials may be present. A hot work permit is required for work involving naked flames or where sparking or arcing can occur. The following is a minimum list of activities that require a hot work permit.

1 Work involving naked flames (welding, flame cutting)
2 Electrical welding
3 Electrical induction pre-heating, stress relieving or use of high temperature thermal calibrators (above 200°C), except in authorised workshops
4 Use of portable grinders (air or electrically powered)
5 Use of flare guns
6 Use of heat shrink blowers in hazardous zones
7 Use of equipment or work on pipe work or vessels contaminated with pyrophoric scale
8 Dry grit/shot blasting in hazardous zones
9 Needle gunning in hazardous zones
10 Use of battery-operated cameras in hazardous zones
11 Opening live electrical junction boxes in hazardous zones where there is a potential for arcing
12 Use of air or hydraulically powered tools capable of generating a spark mechanically in hazardous zones

13 Use of electrically powered equipment capable of generating a spark in hazardous areas
14 Work involving explosives and perforating guns
15 Use of cartridge operated fixing tools in hazardous zones
16 Operation of protected portable diesel engines not tied into fire and gas systems in hazardous and non-hazardous zones
17 Sand blasting

List of Activities That Require a Cold Work Permit

A cold work permit is required to control work in areas where hydrocarbons or other flammable materials are not present. The following is a minimum list of activities that require a cold work permit.

1) Construction, maintenance, overhaul and repair work in operational areas involving the breaking of containment of hydrocarbon systems
2) Spading and de-spading of systems under pressure or which contain flammable substances
3) Working on vessels/equipment contaminated with Low Specific Activity (LSA) scale
4) Working with radioactive sources
5) Working with asbestos or mineral fiber
6) High pressure water jetting or wet grit blasting
7) Ultra High Pressure (UHP) water cutting
8) Removal of handrails, gratings, hatches and fixed ladders
9) Use of air or hydraulically powered tools including needle guns in non-hazardous zones
10) Dry grit/shot blasting in non-hazardous zones
11) Use of lasers
12) Work affecting the availability of fire and gas detection systems
13) Work affecting the availability of fire or explosion control or protection arrangements e.g. deluge, fixed firefighting, fire pumps, fireman etc
14) Work affecting facilities provided for the refuge, protection, escape and evacuation of personnel e.g. ventilation, access/evacuation routes, temporary refuge, emergency lighting
15) Work affecting the availability of process safety and protection arrangements e.g. manual alarm call points, Emergency Shutdown Valve (ESDV) systems, blow down and drains systems

16) General construction, maintenance, overhaul and repair work in operational areas not involving the breaking of containment of hydrocarbon systems
17) Person working in exposed locations e.g. outboard of handrails (over side work), underneath offshore Installations, access to flare or derrick or where persons may fall 2m or more if unprotected
18) Work in confined spaces which does not fall into the hot work category. (This is in addition to an Confined Space Entry Permit which allows entry to the vessel)
19) Use of certified vehicle-mounted work platforms (onshore)
20) Hydrostatic pressure testing of plant or equipment
21) Nitrogen/gas leak testing of plant and equipment
22) Bleeding down vessels to drain or atmosphere
23) Erection or dismantling of scaffolding
24) Use of man riding winches/ baskets
25) Use of certified personnel workbaskets
26) Lifting and rigging operations which require special controls or where the lift has the potential to cause damage to systems or equipment
27) Mobile crane operations (onshore)
28) Use of cartridge-operated tools in non-hazardous zones
29) General electrical work or testing not covered in other categories

3.13 APPENDIX 3: Sequence of Events in Compiling a Typical Permit

Permit Section	Action by	Action to be Taken
1 Task Description	PA	• Requests permit at least 24 hours before. • Provides sufficient information for subsequent personnel to assess the task. Estimates duration and signs this section.
	PA	• AA (in consultation with the PA) defines the type of permit
2. Hazard Identification	PA	• Identifies task hazards, work area and adjacent associated work • List precautions to be taken to control hazards identified • Note any overrides • Specifies the protective equipment to be worn and equipment to be carried • With the AA, identifies whether a Level 1 or 2 Risk Assessment is needed.
3 Cross Referenced Certificates	AA	• Raises supplementary certificates and permits, e.g. ICC & CSE • Approves all isolations • Authorizes Isolating Authority (IA) to apply required isolations prior to permit issue • Lists supplementary certificates raised in connection with the permit and any other information , e.g. material data sheets, manual handling risk assessments and lifting plan etc, connected with the task

4 Sanction to Test	AA	• To control the Sanction to Test (StT) process the permit must be returned to the AA to have the changes to the isolation recorded. The permit must be returned after completion of STT to again be updated
5 Approval	SRP/ AAA	• Completes approval section by signature when assured that previous section and work pack are acceptable. Authorisation box must be completed prior to permit being signed by AA for issue.
6 Site Gas Test	AGT	• Gas tests of equipment and work areas as required. Logs and signs the results. Repeat gas test results must be added to the permit prior to each subsequent re-validation of a permit.
7 Authorization	AA	• Issue of permit; formal handover to Performing Authority after work site inspection by both the AA and PA.
	PA	• Signs to accept responsibility for carrying out specified work. Conducts a tool box talk to inform crew of requirements.
8 Permit Registry	AA	• Permit numbered at the top of the page and entered in to the Permit Register. The number is the next unique sequential number from last entry. • Overrides put in place
9 Re-issue and Return	AA	• For continuing work, allows the permit to be returned to the off going PA at the end of each shift and for the AA to re-validate prior not it's re-issue for the oncoming PA. There is sufficient space for Permit to be revalidated at shift change for a maximum of 7 days by re-issue of permit.
10 Cancellation	PA	• Records completion or non-completion of task and work site inspection with AA
	AA	• Acceptance by AA of sate of completion and work site inspection • Declares that Isolations have been removed per the ICC and systems can be returned to normal operation.
11 Registry of Work Completion	AA	• Completes Permit Register. Cancels overrides and ensures effective closeout of work activity
Each type of permit is supplemented by a declaration signed by all members of the work party to confirm that all the hazards have been explained to them and the associated actions they must take.		

4. Isolation, Lockout and Use of Hold Tags

PJ – HSEMSP 4.4.6.20

4.1 Electrical Isolation

4.1.1 Introduction

4.1.1.1 The purpose of this document is to define the PETROJET functional standard for the safe isolation of electrical plant or equipment from sources of electrical energy.

4.1.1.2 This document applies to the electrical isolation of equipment for work. It shall be followed at all PETROJET operated sites and is applicable to both onshore and offshore. Definitions of voltage levels, HV, LV and ELV are given in Appendix B

4.1.2 Specific Cross references

4.1.2.1 Control of Work

4.1.2.2 Risk Assessment

4.1.2.3 Energy Isolation

4.1.3 Roles and Responsibilities

4.1.3.1 Electrical General Manager

4.1.3.1.1 The Electrical General Manager has produced this document to support the safe system of work and will issue any new revisions of the document for approval.

4.1.3.1.2 The Electrical General Manager is responsible for ensuring that those performing the roles of Responsible Electrical Person and Isolation Authority are competent to do so. He will ensure that the Authorization procedure included as Appendix A of this document shall be complied with in full.

4.1.3.1.3 The Electrical General Manager is also responsible for approving the isolation design, providing assurance that the design achieves the highest quality of isolation reasonably practicable. He can delegate the detailed isolation design to an appropriately competent or authorized person.

4.1.3.2 Branch Manager/ Project Manager/Site Manager

4.1.3.2.1 The Site Manager/Project Manager is responsible for ensuring all Electrical personnel working in their respective spheres of influence are competent to do so and are in accordance with the authorized persons register for their area.

4.1.3.2.2 is responsible for authorizing any deviations from the isolation standard through the risk assessment process. In doing so, he/she may choose to defer or not to carry out the activity and seek further technical guidance if the residual risk is perceived to be excessive.

4.1.3.2.3 is also responsible for ensuring that plant and equipment isolations are subject to the appropriate level of self-regulation and audit.

4.1.3.3 Area Authority (AA)

4.1.3.3.1 The Area Authority is responsible for authorizing the work to proceed under appropriate controls. This includes approval of any preparatory work and, on completion of the task, the work required to complete reinstatement.

4.1.3.4 Isolating Authority (IA)

4.1.3.4.1 The Isolating Authority is responsible for design of an electrical isolation when requested. He is then responsible for safely isolating a specific section of plant or items of equipment to the highest quality and security of isolation, which is reasonably practicable. The Isolating Authority is also responsible for demonstrating the integrity of the isolation to the Performing Authority. The Isolating Authority will be authorized to the maximum voltage level required for the isolation.

4.1.3.5 Performing Authority (PA)

4.1.3.5.1 The Performing Authority is the person charged with the responsibility of carrying out the work and has the right to request demonstration of the integrity of any isolation. The Performing Authority will be a competent person. The Performing Authority will ensure that they have witnessed, at the point of work, that the conductors are dead. The Performing Authority may complete this task themselves if suitably authorized.

Electrical Isolation

4.1.3.6 Responsible Electrical Person (REP)

4.1.3.6.1 This is a role to clearly identify which authorized person has the responsibility for the electrical system; the REP is nominated by the electrical General Manager from those persons having the highest level of authorization required for that site.

4.1.3.6.2 The REP will:

Approve any switching programs

Assess and recommend site personnel for authorization to SAEP, AEP, CI

4.1.3.6.3 At any one time there can be only one REP on site. The REP may also be the isolating authority.

4.1.3.7 Senior Authorized Electrical Personnel (SAEP)

4.1.3.7.1 Electrical personnel who have been formally assessed by the REP and authorized by the Electrical General Manager to switch, isolate and test electrical equipment with voltage levels up to and greater than 1000V, can act as an isolating authority under the safe systems of work for electrical systems with voltage levels up to and greater than 1000V.

4.1.3.8 Authorized Electrical Personnel (AEP)

4.1.3.8.1 Electrical personnel who have been formally assessed by the site REP and authorized by the Electrical General Manager to switch, isolate and test electrical equipment with voltage levels less than 1000V, can act as an isolating authority under the safe systems of work for electrical systems with voltage levels less than 1000V.

4.1.3.9 Competent Isolator (CI)

4.1.3.9.1 In special circumstances individuals can be assessed as competent isolators by the site REP and approved and authorized by the Electrical General Manager for specific items of equipment providing that they have completed the formal training and have been assessed as competent.

4.1.3.10 Competent Person (CP)

4.1.3.10.1 An essential requirement for persons undertaking electrical work is that they are competent, established by virtue of training and or experience. A competent person is capable of recognizing danger and knows when to seek guidance when the work falls outside their area of competence.

4.1.3.10.2 The Electrical General Manager will certify competency of the employee and will maintain a competency matrix for all persons performing isolations

4.1.4 Self - Regulation and Audit

4.1.4.1.1 The Sites shall periodically review isolation related activities, including review of individual isolations and review of overall isolation processes. Such reviews may also include:

4.1.4.1.2 General compliance with this document and any local procedures

4.1.4.1.3 The assessment of non-compliant isolations and the extent of any approved deviations

4.1.4.1.4 Registers of competent and authorized persons

4.1.4.1.5 An audit program shall be established by the Project/Site Manager to ensure that regular checks are made on isolations to provide assurance that the isolations policy and standards are being applied and that lessons learned are communicated effectively.

4.1.5 Isolating Authority - Training, Competency and Authorisation

4.1.5.1.1 Refer to Appendix A for Detail and PETROJET Pro-forms.

4.1.5.1.2 The Isolating Authority will be authorized by the Electrical General Manager based on the following criteria. The Isolating Authority will be:

4.1.5.1.3 Familiar with the site

4.1.5.1.4 Have Electrical First Aid Training

4.1.5.1.5 Will be explosion(EX) certified, when working on Hydrocarbon Plants

4.1.5.2 Where appropriate, will have HV operational training

4.1.5.2.1 Will have been formally and practically assessed for electrical isolations and recognized as authorized at a specific voltage level for the work site

4.1.5.3 The Authorization levels on site will be as follows:

4.1.5.4 Authorized Electrical Person (AEP) authorized to isolate electrical circuits up to 1000V

4.1.5.5 Senior Authorized Electrical Person (SAEP) authorized to isolate electrical systems above 1000v and prepare and carry out switching operations

4.1.5.6 In special circumstances individuals can be assessed as Competent Isolators (CI) for specific items of equipment providing that they have completed the formal training and have been assessed as competent on the specific tasks. Site management is responsible for ensuring that this is recorded so that it is clear which tasks these individuals are competent to undertake.

4.1.6 PPE

4.1.6.1 The following equipment, appropriate to the voltage level will be available:

4.1.6.1.1 Insulated tools and test equipment

4.1.6.1.2 Electrical quality insulating gloves

4.1.6.1.3 Face protection

4.1.6.1.4 Insulated barriers and Mats

4.1.6.1.5 Safety rescue hooks

4.1.7 Isolation and Planning

4.1.7.1 Isolation

4.1.7.1.1 The highest quality and security of isolations, which is reasonably practicable in the prevailing circumstances, shall always be used. This

document sets out the minimum recommended isolation standard to be used in PETROJET.

4.1.7.1.2 Any isolation, which does not meet the Minimum Recommended Isolation Standard as defined in section 7.5, including the application of the Mandatory Safeguards, must be assessed using the Level 2 Risk Assessment Process before the isolation is approved. Should any non-compliant isolation have to be repeatedly justified by risk assessment, consideration shall be given to a permanently engineered solution.

4.1.7.2 Isolation Planning

4.1.7.2.1 Isolation of any piece of equipment shall be planned to minimize risk to personnel and property. To achieve this, the following information will be required:

4.1.7.2.1.1 A clear description of the work, ensuring that if the activity includes electrical work that this is clearly identified

4.1.7.2.1.2 A clear description of the equipment which needs to be isolated.

4.1.7.2.1.3 A drawing (Typically a Single Line Diagram) identifying the isolation, earth and disconnection points shall be furnished with every isolation plan.

4.1.7.2.1.4 Tag references of all the switching and isolation points

4.1.7.2.1.5 Locks and Labels for securing the isolation points

4.1.7.2.1.6 Test equipment for proving effectiveness of the isolation

4.1.7.2.1.7 Switching program detailing the sequence of switching required to achieve the isolation where the equipment is fed from more than one source or at the REP's discretion.

4.1.7.3 Switching Programs

4.1.7.3.1.1 Where main distribution equipment is to be switched it is essential that the equipment be switched in the correct sequence. To achieve this, a switching program will be required, detailing the switching sequence. This will be accompanied by a marked up single line drawing. The switching program will be prepared by an SAEP and checked by the REP. See Appendix E for a blank Switching Program. The Switching Program does not replace an ICC.

4.1.7.4 Isolation Methods

4.1.7.4.1.1 The methods of isolation normally available are detailed below; listed in descending order of security and effectiveness.

4.1.7.4.1.2 Key to all of these isolations is the positive identification of the equipment to be isolated, to this end all equipment and isolation points on a site will be uniquely identified and clearly labeled, a secondary check could be to use the cable numbers which connect the isolator to the equipment.

4.1.7.4.1.3 If there is any doubt about the correct identification of the equipment to be isolated and the isolation point then the work should be suspended and clarification sought.

4.1.7.4.1.4 Ensure the requirements of section 7.6, live working and proving dead are followed

4.1.7.4.1.5 Isolate Circuit, Prove Dead, Disconnect, Lock, Label and Earth

4.1.7.4.1.6 This is a positive isolation of the main phase conductors with an isolator and disconnection of the main phase and neutral conductors by removal of fuses, links or withdrawal of a circuit breaker or some other means of disconnection. The circuit is proven dead to ensure that the circuit is discharged and is earthed to prevent recharging. Locks and labels are applied to all points of isolation and earthling

4.1.7.4.1.6.1 Note: When the isolation requires switching of main distribution equipment, a Switching Program is also required.

4.1.7.4.1.7 Isolate Circuit, Prove Dead, Disconnect, Lock and Label

4.1.7.4.1.7.1 This is a positive isolation of the main phase conductors with an isolator and disconnection of the main phase and neutral conductors by removal of fuses, links or withdrawal of a circuit breaker or some other means of disconnection. The circuit is proven dead to ensure that the circuit is discharged. Locks and labels are applied to all points of isolation.

4.1.7.4.1.7.2 Note: Where the isolation switch meets the minimum standard for disconnection, as defined in IEC 60947, and it includes all phases and neutral then no further disconnection is necessary if the risk of physical disconnection outweighs the advantage. However, this is a minimum standard and it is expected that if fuses or links are part of the circuit that they will be removed.

4.1.7.4.1.8 Isolate, Lock and Label

4.1.7.4.1.8.1 This is a positive isolation of the main phase conductors with an isolator; the isolator type will be of such construction that it breaks the main phase conductors when open. Locks and labels are applied to all points of isolation.

4.1.7.4.1.8.2 Note: Isolation by auxiliary control circuits only is not acceptable for isolation purposes.

4.1.7.5 Isolation Standards

4.1.7.5.1.1 Table 1 Minimum Recommended Isolations Standard (Appendix G)

4.1.7.6 Testing Isolation Integrity – Proving Dead

4.1.7.6.1 All electrical conductors shall be considered to be live until positively proven dead using an approved live line tester suitable for the voltage to be tested; this tester will be proved both before and after use. The conductor will be proven dead between circuit and earth. Where there is a neutral or the system is unearthed the conductors will also be proven dead between all of the circuit conductors. It is a requirement under the PETROJET Golden Rule of Energy Isolation that energy has been discharged and that testing has proved the isolation.

4.1.7.6.2 The Performing Authority will be required to witness this test or prove dead themselves before commencing work on any conductor.

4.1.7.6.3 It is essential that after testing with an applied voltage, a conductor be adequately discharged to earth using approved discharging equipment. Once discharged, the conductor is again proven dead.

4.1.7.6.4 Proving Dead is considered to be live working and therefore each location must assess the risks of this activity based on site conditions and produce a standalone risk assessment. Minimum requirements for live working or proving dead are:-

4.1.7.6.4.1 Accompanied working, in accordance with section 7.5

4.1.7.6.4.2 Standby man to be First aid trained and understand electrical risks

4.1.7.6.4.3 All jobs to have an appropriate emergency response plan. As a minimum this is:

4.1.7.6.4.3.1 Raise alarm,

4.1.7.6.4.3.2 use rescue hook – don't touch person,

4.1.7.6.4.3.3 Apply CPR as required.

4.1.7.6.5 For hazardous areas, the proving dead should be preceded by a Gas test using at least a personal gas monitor

4.1.7.7 Risk Assessment of Non-compliant Isolations

4.1.7.7.1.1.1 In the event that the Minimum Recommended Isolation Standard cannot be achieved, a Risk Assessment shall be carried out in accordance with SSOW guidelines

4.1.7.7.1.1.2 The assessment team, including the REP shall specify appropriate safeguards, which may replace or be in addition to those listed in Table 1. The team shall be satisfied that these safeguards shall reduce the risks to an acceptable level before the task requiring isolation is permitted to proceed.

4.1.7.7.1.1.3 The Project Manager must authorize all level 2 risk assessments prior to any work proceeding.

4.1.7.8 Live Working

4.1.7.8.1

4.1.7.8.2 Live working is defined as work on or in close proximity to live conductors; this includes testing. All conductors will be assumed live unless proven dead.

4.1.7.8.3

4.1.7.8.4 Live work will not be a normal activity and will not be carried out unless there is no other reasonably practicable method available. Where it is not possible to avoid live work, an appropriate level of risk assessment shall be carried out before work commences.

4.1.7.8.5 Is the live working justified? Consider:

4.1.7.8.6 If the work could be done when equipment is isolated (an example of work which must be done live would be work on battery systems)

4.1.7.8.7 If isolating the equipment introduces other greater safety risks

4.1.7.8.7.1 When identifying the risks consider:

4.1.7.8.7.1.1 Voltage level

4.1.7.8.7.1.2 Fault level of the equipment and the arc energy if a fault develops while working

4.1.7.8.7.1.3 Working environment (wet, dusty, noisy, vibration, at height etc)

4.1.7.8.7.1.4 What exposed voltage levels will be adjacent to the worksite
4.1.7.8.7.1.5 What could go wrong
4.1.7.8.8 Can adequate precautions be taken to reduce risk to an acceptable level? Some precautions, which should be considered:
4.1.7.8.9 Competent people with training and experience
4.1.7.8.10 Insulated tools and test equipment
4.1.7.8.11 Accompanied work - Accompanying person to be First Aid Trained and it should be clear what is expected of the accompanying person to ensure that they are competent to accomplish this expectation
4.1.7.8.12 Insulated barriers, mats, grab hooks
4.1.7.8.13 Work site control (e.g. cordoning off area, limiting access)
4.1.7.8.14 Additional and / or specialist personal protective equipment
4.1.7.8.15 Reference to any specific safety rules or guidance

4.1.7.9 Isolations for Work Near Live Conductor

4.1.7.9.1 Frequently, work inside complex control equipment means that although the circuit to be worked on is isolated, there may be other circuits that are still energized. It is a requirement that the risk from these adjacent conductors is assessed and appropriate precautions taken to reduce the risk.
4.1.7.9.2 See Appendix D for an adjacent working assessment form.

4.1.8 Isolation Implementation and Control

4.1.8.1 Security

4.1.8.1.1 Any isolation must effectively disconnect the worksite from all sources of energy.
4.1.8.1.2 Where possible, locks must be used to prevent unauthorized de-isolation; to this end unique locking devices must be used.
4.1.8.1.3 Keys to any locks used for isolation purposes must be effectively controlled via the Area Authority and the Permit to Work – Isolation Confirmation Certificate (ICC). Only when the ICC allows should the Area Authority make the key available to remove a lock.
4.1.8.1.4 The locks should be a high security type, which are tamper proof. Where possible a multi-hasp type will be used and the lock and label will be applied.
4.1.8.1.5 Once the locks are in place the keys will be returned with the ICC to the Area Authority who will control the keys until a de-isolation or a sanction to test has been approved.

4.1.8.2 Isolation Labeling

4.1.8.2.1 All isolation points shall be clearly identified, tagged and recorded on the ICC. A drawing (Typically a Single Line Diagram) identifying the isolation, earth and disconnection points shall be furnished with every isolation plan.

4.1.8.2.2 At the isolation point there should be an Isolation Label with the following clearly identified:

4.1.8.2.2.1 ICC number
4.1.8.2.2.2 The Tag number of the isolation point
4.1.8.2.2.3 Reason for isolation
4.1.8.2.2.4 Isolation Authority name and signature
4.1.8.2.2.5 Date

4.1.8.2.3 At the Earth point there should be an isolation Label with the following clearly identified:

4.1.8.2.3.1 ICC number
4.1.8.2.3.2 The Tag number of the isolation point
4.1.8.2.3.3 Reason for isolation
4.1.8.2.3.4 Isolation Authority name and signature
4.1.8.2.3.5 Date

4.1.8.2.4 Adjacent live circuits will be identified with a Red Danger notice, e.g. live bus bar shutters when work is to be carried on the circuit.

4.1.8.2.5 Labels are defined in the PETROJET LOTO procedure

4.1.8.3 Positive Identification of Equipment

4.1.8.3.1 To allow effective isolation, equipment must be clearly labelled with unique tag numbers.

4.1.8.3.2 If equipment is not tagged then another method of positive identification of equipment must be used, e.g. use of the cable number and cable schedule and interconnection drawings.

4.1.8.3.3 These provide a unique number, which should be located at each end of the cable. If there is any doubt about the correct identification of the equipment to be isolated and the isolation point, then the work should be suspended and clarification sought.

4.1.8.4 Control of Isolations

4.1.8.4.1 The ICC, cross-referenced to all relevant work permits, shall be the principal means of control once isolations are in place. The ICC performs the following functions:

4.1.8.4.1.1 Identifies the plant concerned and the reasons for isolations
4.1.8.4.1.2 Authorizes isolation by disciplines
4.1.8.4.1.3 Records the complete list of isolation points
4.1.8.4.1.4 Records ‘prove dead’ operations
4.1.8.4.1.5 Records the position of any earths applied

4.1.8.4.1.6 Records locking points and lock numbers

4.1.8.4.1.7 Records where isolation labels have been applied

4.1.8.4.1.8 Confirms that the isolation has been effected

4.1.8.4.1.9 Authorizes any temporary de-isolations and isolations necessary for testing (sanction for test)

4.1.8.4.2 Authorizes and records de-isolations on completion of the task

4.1.8.4.3 The Area Authority must effectively control all keys for locks used for isolation.

4.1.8.5 Long-Term Isolations

4.1.8.5.1 Long-term Isolations (LTI) are defined as those that no longer have work performed against them. Each site should maintain a detailed register of long-term isolations with a reason why they are in place.

4.1.8.5.2 Long-term isolations shall be subject to two levels of review:

4.1.8.5.2.1 A weekly review of the register to check the status of the isolations in place

4.1.8.5.2.2 A quarterly review to physically check all the isolation points to confirm their security and integrity and that the keys to all locks are being adequately controlled

4.1.8.5.2.3 If the LTI is in place for more than 1 year, review the requirement for LTI. Consider if something else could be done (i.e. decommission circuit)

4.1.8.5.3 Before any work is performed against a long-term isolation a full integrity check of all isolation points is required and the point of work must be proven dead.

4.1.8.5.4 Before an electrical LTI is removed a physical check of the equipment to be energized will be made to ensure that the equipment is safe to energize.

4.1.8.6 Monitoring Isolation Integrity

4.1.8.6.1 Locks and effective control of their keys, maintain the integrity of electrical isolation. An isolation lock may not be removed unless written permission is given on its ICC. A lock may not be removed by any other means than the key. If for any reason the key is not available, the Area Authority, Responsible Electrical Person, Isolation Authority and Performing Authority must apply in writing to the Project Manager/Site Manager / Site Controller for permission to remove the lock.

4.1.8.6.2 Where possible, a multi-hasp device will be used to allow for more than one padlock at each isolation point.

4.1.8.6.3 If the integrity of the isolation requires the use of barriers or shields then their condition will be checked before the start of any work activity.

4.1.8.7 De-isolation of Plant

4.1.8.7.1 Before plant is de-isolated the Area Authority shall ensure that all work is complete, all permits are cancelled, all covers and safety barriers have been replaced, the plant has been tested and inspected and any relevant certification is completed. When the Area Authority is satisfied and has checked that there are no other permits cross referenced to the isolation, he will instruct the Isolation Authority to de-isolate the plant.

4.1.8.7.2 In a Hazardous Areas before de-isolation, the plant must be inspected to ensure that the equipment meets the requirements to prevent danger in the hazardous area, commonly known as an EX inspection.

4.1.9 APPENDIX A: PROCEDUREFOR ELECTRICAL AUTHORIZATION

A. INTRODUCTION

A.1 Key functions are defined within the PETROJET Safe Systems of Work that must be fulfilled in order to ensure that the controls are in place to provide the safe execution of specific activities.

A.2 Authorized functions are only assigned to personnel who have completed the necessary training and have been formally assessed.

A.3 Electrical Roles and responsibilities are defined in Section 3

B. TRAINING AND COMPETENCY REQUIREMENTS

B.1 The requirements for training, competency evaluation and authorization are in Table 1, Training and Competency Requirements for Authorization.

C. AUTHORIZATION PROCESS

C.1 No person shall be authorized under this procedure until they have completed the required training and the competency evaluation detailed in **Table 1: Training and Competency Requirements for** and where required a written statement of competency has been received from the assessor by the authorizer.

C.2 Authorization Assessment

C.2.1 Authorization will be based on written, oral and practical demonstration of knowledge.

C.2.2 The candidate will provide written responses to a selection of question relating to Safe Systems of Work and facility specific information. The site will retain these responses.

C.2.3 The candidate will also be asked to demonstrate on site appropriate site knowledge, and how to apply the Safe Systems of Work to an appropriate operational exercise.

C.2.4 The REP will assess competency of Authorized Electrical Persons (AEP), Competent Isolators (CI) and Senior Authorized Electrical Persons (SAEP)

C.3 Certificate of Authorization and Statement of Competency

C.3.1 Authorization is recognized by a certificate of electrical authorization (see *Appendix A)*, clearly stating the level and duration of authorization. If required, the competency assessor shall supply a written statement of competency to the authorizer (see *Appendix B for electrical competency*).

C.4 Authorization Validity

C.4.1 Authorization shall be valid for the maximum duration stated in **Table 1**which corresponds with the refresher training requirements associated with the duties.

C.4.2 Authorization shall cease if the person moves to a new post, even if the new post is on the same site.

C.5 Authorization Register

C.5.1 The General Maintenance General Manager shall maintain a register of all Electrical Authorized Personnel.

C.5.2 The Site Manager/ Site Controller/ Offshore Installation Manager shall maintain a register of all personnel authorized at their facility.

C.5.3 This register shall be available within the facility at the location from where permits are normally issued.

C.6 Records

The Electrical General Manager will retain the assessment record sheet and its attachments. The assessor will issue Competence Certificates to the candidate and the Site Manager/ Site Controller/ OIM as appropriate and a copy issued to the successful candidate. The site will retain the original certificate**.**

Table 1: Training and Competency Requirements for Authorization

Function	Training	Competency Evaluation	Valid (yrs)	Authorized by
Competent Isolator	Permit to Work. Performing Authority Energy Isolation Specific training	Assessment by Site Responsible Electrical person Written statement of competence by REP See Appendix D for Electrical Assessment Areas	3	Electrical General Manager
Authorised Electrical Person	Permit to Work. Performing Authority Energy Isolation. First aid Comp'Ex (on hydrocarbon sites)	Assessment by Site Responsible Electrical person Written statement of competence by the (REP) See Appendix D for Electrical Assessment Areas	3	Electrical General Manager
Senior Authorised Electrical Person	Permit to Work. Performing Authority Energy Isolation. First aid Comp'Ex (on hydrocarbon sites) HV switching	Assessment by Site Responsible Electrical person Written statement of competence by REP See Appendix D for Electrical Assessment Areas	3	Electrical General Manager

Function	Training	Competency Evaluation	Valid (yrs)	Authorized by
Responsible Electrical Person	Permit to Work. Area Authority Energy Isolation. First aid Comp'Ex (on hydrocarbon sites) HV switching (if applicable for the site)	Assessment by 3rd Party assessor Written statement of competence by 3rd Party assessor See Appendix D for Electrical Assessment Areas (which will depend on site voltage levels	3	Electrical General Manager

Electrical Isolation

PPENDIX B ELECTRICAL AUTHORIZATION CERTIFICATE

	Electrical Authorization Certificate

Add individuals NAME:

……

Was found to be competent to operate safely in the following areas

Mechanical isolations for systems of less than 1000V	
Control and Instrumentation systems with voltages less than 50V	
Electrical circuits with voltages less than 1000V	
Electrical distribution systems with voltages less that 1000V	
Electrical circuits with voltages greater than 1000V	
Electrical distribution systems with voltages greater than 1000V	
Electrical distribution systems with voltages of 110KV	
/Specific *equipment type* at *voltage level* See attached training certificate	
Role of Responsible Electrical Person for District	

Assessor Name……

Date……

This certificate authorizes the above name person as a

Competent Isolator (CI)	
Authorized Electrical Person (AEP)	
Senior Authorized Electrical Person (SAEP)	
Responsible Electrical person	

For ……site

For a period of……years

Authorized By……

Date……

Accepted By……

Date……

Details of any restrictions to this authorization:

Electrical Isolation

Appendix C Electrical Competency Certificate

Electrical Competency Certificate
Name;
Role: (AEP, SEAP, REP)
Site Location;

Experience; (experience in job, formal training, etc)

Site Knowledge; (generation, HV distribution including bus bar architecture HV switching procedures, LV switching arrangements, knowledge of site operating basis, earthling apparatus, battery and UPS systems etc, as appropriate to authorisation level)

Site Practical; (awareness of electrical risks, switching, earthling apparatus, ICC, PTW, TRA etc)

Electrical Procedures; (questionnaire completed)

Assessment performed by

DATE:

Appendix D : Electrical Training Certificate

Competent Isolator Training Certificate

Name of Trainee;

Site Location;

Equipment trained on: (Specific equipment types Manufacture and Model Number etc)

Operations trained in: (Specific operation that the training has covered, attach any specific operations instructions)

Areas of Assessment	CI	AEP	SAEP	REP
Electrical Isolation Standard	X	X	X	X
Electrical Safety Guidance	X	X	X	X
Safe Systems of Work (ICC, PTW, TRA)	X	X	X	X
Appropriate Site Knowledge	X	X	X	X
Interpretation of drawings		X	X	X
Comp'Ex EX Certificat (for hydro-carbon sites)		X	X	X
Isolation of LV supplies up to 50V		X	X	X
LV electrical testing up to 50V		X	X	X
LV fault finding up to 50V		X	X	X
First Aid Certificate covering CPR and electric shock treatment		X	X	X
Electrical protection		X	X	X
Switching programs		X	X	X
Distribution switching		X	X	X
Isolation of LV supplies		X	X	X
LV electrical testing		X	X	X
LV fault finding		X	X	X
HV switching			X	*
Isolation of HV supplies			X	*
HV electrical testing			X	*
HV fault finding			X	*
Specific equipment training for competent isolators	X			

Training assessment; (Assessment of the training which will cover specific knowledge of an equipment hazards or site procedures covering this equipment)

Assessment performed by
Date

Appendix E Electrical Assessment Areas

* These areas will be site dependant given the maximum voltage level of the site

The assessment process will consist of both a written and practical assessment elements.

AA	Area Authority
AEP	Authorized Electrical Person
CI	Competent isolator
D	Main conductor disconnected
E	Earth the isolated conductor
IA	Isolating Authority
ICC	Isolation Control Certificate
Is	Isolate
IP	Ingress protection
SSOW	Safe System Of Work
LL	Lock and Label
LTI	Long-term isolations

P	Prove dead with proprietary voltage tester
PA	Performing Authority
REP	Responsible Electrical Person
SAEP	Senior Authorized Electrical Person
SP	Authorized Switching Programme
PTW	Permit to Work
HV	"High Voltage" voltages that exceed 1000Vac or 1500Vdc between conductors or 600Vac or 900Vdc between conductors and earth
LV	"Low Voltage" is a voltage normally exceeding extra low voltage by not exceeding 1000V ac or 1500 Vdc between conductors or 600Vac or 900Vdc between conductors and earth
ELV	"extra low voltage" Voltage which does not exceed 50V ac rms between conductors or between any conductor and earth, in a circuit isolated from the supply be means such as a safety isolating transformer or converter with separate windings. A voltage which does not exceed 50V dc between conductors or any conductor and earth in a circuit isolated from Higher voltage circuits

Appendix G: Equipment specific precautions

G.1 Work on High voltage windings of rotating machines and Transformers

- Where the field circuit is energized from a separate supply, the field circuit must be isolated at the field main circuit breaker and locked off
- Motor driven exciters must be isolated and locked off
- Supplies to tap change mechanisms must be isolated and locked off

- Voltage transformers are to be isolated via their individual isolation switches, fuses and LOTO applied or their MCCB or by the primary line fuses
- Precautions must be taken to prevent wind milling of rotating machines

G.2 Generator and Generator/Transformer prime movers

The prime mover must be isolated and locked off from all sources of motive power by the following

- Close the fuel control valve and apply LOTO
- Close air start valve and apply LOTO
- Disconnect CEC (ignition system) power supply and apply LOTO
- Disconnect safety Circuit breaker and apply LOTO

Appendix H: Adjacent Working Assessment

ADJACENT WORKING ASSESSMENT (working adjacent to live conductors)		
Sketch of Working Area		
Is working position marked on sketch?	YES	NO
Is the working area clear and free of debris?	YES	NO
Are live adjacent voltages marked on sketch?	YES	NO
Is shrouding IP rating marked on sketch?	YES	NO
Size of smallest loose conductive component to be worked with?		mm
Is the IP rating below the working area adequate to prevent any loose components being worked with falling on to live components?	YES	NO
Is the min IP protection IP2X or more?	YES	NO

Position:		Date:	
Name:		Signature:	

- If any of the above are answered with “NO”, then please review work with REP
- **IP Classification list below**

ADJACENT WORKING ASSESSMENT (working adjacent to live conductors)

IP – INGRESS PROTECTION

The IP classification system designates, by means of a number, the degree of protection provided by an enclosure against impact or dust and water ingress. Please note that the IP classification should not be construed as indicating corrosion resistance.

Degrees of Protection to IEC 529

IP Classification list

IP0X	Non-protected.
IP1X	Protected against a solid object greater than 50mm, such as a hand.
IP2X	Protected against a solid object greater than 12mm, such as a finger.
IP3X	Protected against a solid object greater than 2.5mm, such as a tool or wire.
IP4X	Protected against a solid object greater than 1.0mm, such as wire or thin strips.
IP5X	Dust-protected. Prevents ingress of dust sufficient to cause harm.
IP6X	Dust tight. No dust ingress.

Appendix I : Switching Programme

Site:	
ICC number	
WCC number	

Reason for switching:
Ref Drw no: Electrical Key Single Line Diagram

Item	Voltage	Switchboard	Cub/ Cir Ref.	Action	Comments	Key No	By

Item	Voltage	Switchboard	Cub/ Cir Ref.	Action	Comments	Key No	By

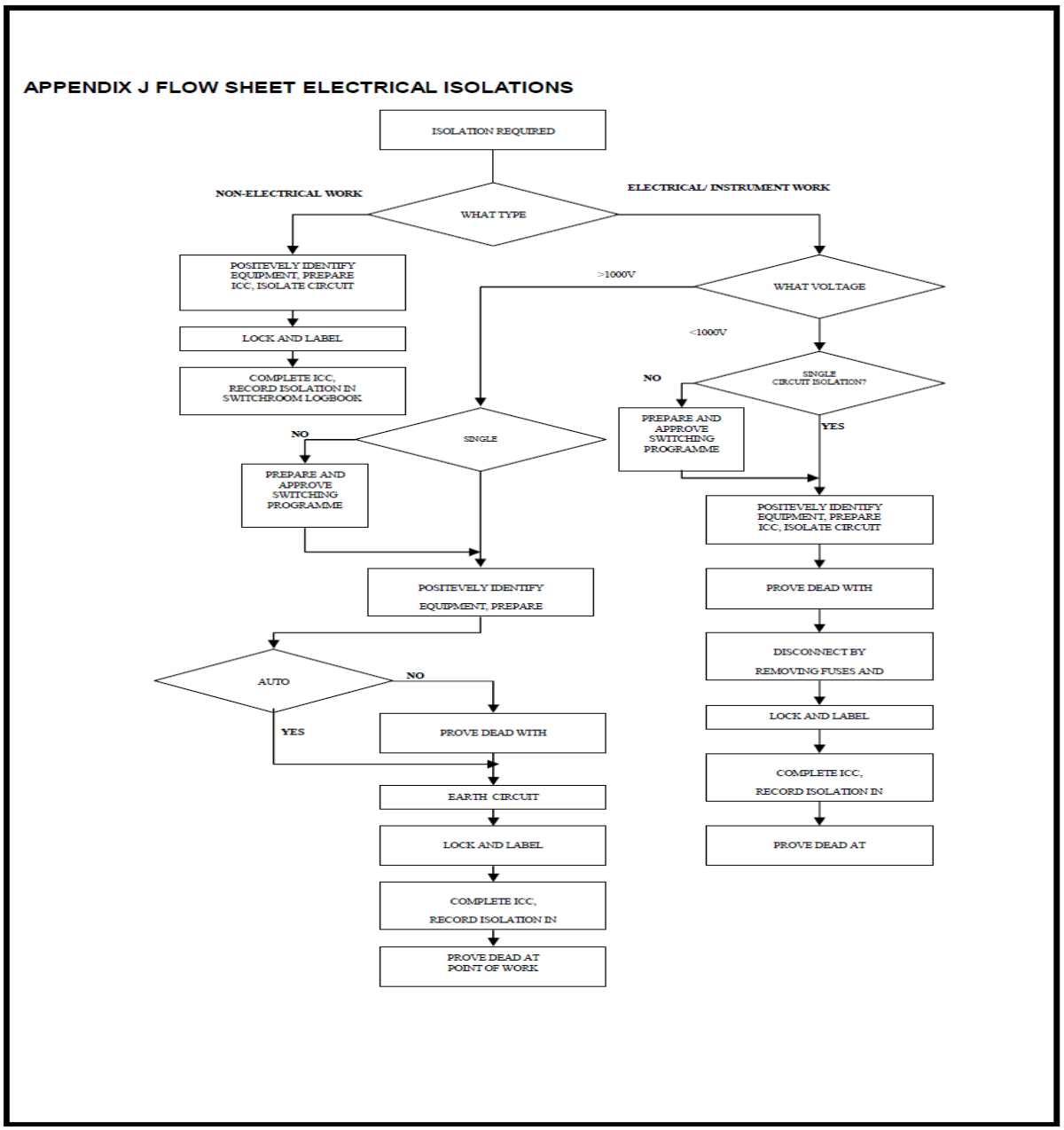
Prepared by: **Date:**

Checked by: **Date:**

Electrical Isolation

Appendix J Flow Sheet

Electrical Isolations



Appendix K Minimum Recommended Isolations Standard

Isolation requirements for	Operating Voltages

	< 1000V	>1000V
Non-electrical work only	**Is+LL**	**Is+LL**
Electrical work on single circuit	**Is+P+D+LL**	**Is+P+D+LL+E**
Electrical work on distribution system	**SP+Is+P+D+LL**	**SP+Is+P+D+LL+E**

Note 1: If any work requires Proving Dead in a Hazardous Area, a gas monitor will be required with a Hot Work 2 (Spark Potential) Permit.

Note 2: If any work is done adjacent to live conductors then this must be considered when providing the isolation.

Is – Isolation of the main phase conductors with an isolator

LL – Lock and labelled

D – Main phase and neutral disconnected

P – Prove dead with an approved voltage tester which is proved before and after testing

E – Earth the isolated conductors

SP – Authorized Switching Programme

Precautions	< 1000V	>1000V
Authorisation level permitted to perform the isolation	AEP, SAEP	SAEP or AEP under direct supervision of SAEP
Accompanied for proving dead, distribution switching, testing, fault finding	AEP, SAEP based on Risk assessment	SAEP
Communications link	Yes	Yes
PPE required until proved dead	Face protection & electrical quality gloves	Face protection & electrical quality gloves

Note 3: If work is to be accompanied there must be a clear understanding between the Isolating Authority and the accompanying person identifying what the accompanying person will do in the event of an emergency.

4.2 Energy Isolation

4.2.1 Introduction

4.2.1.1 This practice establishes minimum energy isolation, lockout/tag out (LOTO), isolation monitoring and reinstatement of plant or equipment.

4.2.1.2 An energy source is any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, and thermal energy that could cause harm to people.

4.2.2 Objectives

4.2.2.1 The objectives of this practice are to:

4.2.2.1.1 Provide general information and procedures regarding the safe means to isolate equipment

4.2.2.1.2 Define responsibilities for ensuring effective isolation before work commences

4.2.2.1.3 Set out how equipment is prepared prior to isolation

4.2.2.1.4 Set out how isolation is achieved for individual work groups or where several separate groups are involved

4.2.2.1.5 Describe how energy isolation is assured through inspection and testing prior to work commencing, and at intervals thereafter

4.2.2.1.6 Define the process and responsibility for returning equipment to safe operation

4.2.3 Scope

4.2.3.1 Electrical isolations are covered in a separate practice within this manual.

4.2.4 Definition of Terms

4.2.4.1 **Isolation** - A method of preventing the passage of fluids through connecting pipe work in order to allow safe access to vessels or other intrusive equipment maintenance.

4.2.4.2 **Positive Isolation** - Isolation by means of a fixed barrier, such as a blank flange (following spool removal), blind plate or spade plate which must be conforming to the pipe work specification in which it is installed.

4.2.4.3 **Competent Person** - A person who, by reason of his training, knowledge, experience and judgment is considered by management to be capable of planning and supervising the safe isolation of plant. Need isolating authorities to be trained and tested – i.e. formally assessed competent and on a competence register

4.2.4.4 **Process Fluid** - Live crude, stabilized crude, gas, NGL or any other produced fluid containing hydrocarbon gas or liquid.

4.2.4.5 **Hazardous Utility** - Corrosive, toxic or irritant chemical fluid, nitrogen, steam or hot water, diesel oil, Aviation Turbine fuel and other fluids that could have an environmental impact.

4.2.4.6 Non-Hazardous Utility

4.2.4.6.1 Cold water, air.

4.2.4.7 **Immobilized valves** - Any isolation must achieve and maintain effective containment of the relevant fluid for as long as required. Valves shall be locked or otherwise immobilized to prevent unauthorized operation. It may be necessary to apply additional immobilizing devices under certain circumstances.

4.2.5 Responsibilities

4.2.5.1 Area Authority (AA)

4.2.5.1.1 Ensure that this practice is rigorously followed in their area of responsibility

4.2.5.1.2 Ensure all persons applying and removing isolations have been authorized … including himself!

4.2.5.1.3 Design the method of isolation and record on ICC form.

4.2.5.1.4 Confirm that all isolations are identified and properly locked and tagged out prior to work starting

4.2.5.1.5 Confirm Isolation Integrity by Pressure Build-Up (PBU) or Pressure Fall Off (PFO) testing.

4.2.5.1.6 Monitor Isolation integrity for the duration of the work/while the ICC remains “live”

4.2.5.1.7 Return equipment to use on behalf of Contractors except in the case of field equipment where they may give a Contractor authorization to return it to service

4.2.5.1.8 Complete the Isolation Confirmation Certificate (ICC) as described on the ICC form(Appendix 1)

4.2.5.2 Isolation Authorities (IA)

4.2.5.2.1 Ensure Isolation training completed and is an authorized isolating authority

4.2.5.2.2 Ensure proper methods of isolation are adhered to and that the isolations are properly logged on the ICC and LO/TO applied.

4.2.5.2.3 Confirm Isolation Integrity by Pressure Build Up (PBU) or Pressure Fall Off (PFO) testing.

4.2.5.2.4 Inform other personnel who may be affected by the isolation who are in the area that they are prohibited from attempting to reenergize equipment which is locked/tagged out

4.2.5.2.5 When time to reenergize, ensure the equipment is safe to remove isolations; personnel clear off the area and make the work site safe before returning back to normal.

4.2.5.2.6 Close out the ICC

4.2.5.2.7 Physically put the isolation LO/TO

4.2.5.2.8 Where locks are physically utilized, remain custody of key until handed to a replacement isolating authority or until isolation is removed

4.2.5.3 HSE

4.2.5.3.1 Inspect the work site and monitor the isolation process.

4.2.5.3.2 Audit the ICC to ensure compliance with this practice.

4.2.6 isolation methods

4.2.6.1 The highest quality of isolation which is reasonably practical must be applied to every individual isolation point to control energy sources.

4.2.6.2 The methods of isolation normally available are listed below in decreasing order of security and effectiveness.

4.2.6.3 Positive Isolation

4.2.6.3.1 Positive isolation may be effected as follows:

4.2.6.3.1.1 **Spool Removal** - Removal of pipe-work section with blank flanges rated for full line design pressure onto live ends.

4.2.6.3.2 **Spade Isolation** - Witnessed insertion between flanges of a blind plate; swinging of a spade plate. Any such insertion must be rated to the pipe design specification.

4.2.6.3.3 Positive isolation is regarded as the most secure method and must always be considered when planning maintenance work.

4.2.6.3.4 Positive isolation is mandatory for work involving confined spaces.

4.2.6.3.5 For any naked flame work on hydrocarbon (oil, gas, diesel, heating oil, etc…) systems, the line shall be shutdown, vented/drained, N2 purged or water filled and flushed and positive isolations installed.

4.2.6.3.6 Single and double block valves with vent are not acceptable means of isolation when performing naked flame work.

4.2.6.3.7 Positive isolation is recommended in the following situations(implementation of alternative isolation standard is to be accompanied by specific level 2 Risk Assessment:

4.2.6.3.7.1 Long duration isolations, e.g. more than one week.

4.2.6.3.7.2 Where equipment is to be mothballed.

4.2.6.3.7.3 Where hot work is to be undertaken on water or utility lines if the lines have the potential or have been physically connected to a hydrocarbon service.

4.2.6.3.7.4 For process fluids at or above auto-ignition temperature.

4.2.6.3.8 Note: Double Block and Bleed (DBB) and Single Valve Isolation (SVI) will be used as transient isolation to enable Positive Isolation to be effected. Systems shall be hydrocarbon freed (see safe working practice for breaking containment) before installing positive isolation. Isolation shall be performed under a PTW against an approved procedure.

Double Block and Bleed (DBB)

4.2.6.3.9 Consists of closure of two block valves in series with an intermediate bleed valve to a safe location between them. The safe location may be to atmosphere, sea or to vented flare/drain vessels.

4.2.6.3.10 DBB isolation is the most secure form of valve isolation, if the valves can provide a reliable seal under the particular conditions of service.

4.2.6.3.11 ESD valves may be used as part of the DBB isolation. The isolation must be effected in such a way that the integrity of each valve is proven during the isolation.

4.2.6.3.12 DBB must normally be used for routine day-to-day maintenance activities, wherever it is available and reasonably practicable.

4.2.6.3.13 Single valves of a type which provide a double seal in a single body and with a bleed between the seals are acceptable as DBB. Examples of such valves are suitably specified double wedge gate, parallel expanding gate, and double seating ball valves.

4.2.6.3.14 Actuators for ESD and MOV must be isolated by removing the hydraulic, pneumatic, or electrical sources/signal and tagged to prevent operation.

4.2.6.3.15 Non-return valves (check-valves), flow control valves and other valves which may not provide tight shut-off must not be used

4.2.6.3.16 The bleed point shall remain open on completion of the isolation integrity check and shall be routed by means of a rated hose to a safe location. The bleed point shall be periodically monitored to ensure that the primary valve is not passing.

4.2.6.4 Single Valve Isolation (SVI)

4.2.6.4.1 Consists of closure of a single block valve. Where the security of the isolation can be compromised by operation of a single valve, positive measures to prevent operation must be taken.

4.2.6.4.2 Any valve used for SVI must provide a reliable seal. Non-return valves (check-valves), flow control valves and other valves which may not provide tight shut-off must not be used.

4.2.6.4.3 Pneumatically and hydraulically operated valves which fail open should not be used

4.2.6.4.4 Any valve used for SVI must provide a reliable seal.

4.2.6.4.5 Non-return valves, flow control valves, pressure control valves and other valves which may not provide tight shut-off must not be used.

4.2.6.4.6 Emergency Shutdown (ESD) valves may be used providing they can be reliably immobilised.

4.2.6.4.7 SVI may be used under circumstances where the valve arrangements or mandatory safeguards specified in Appendix 2 cannot be achieved or otherwise not reasonably practical due to the lack of suitable equipment. In these cases, a Level 2 risk assessment must be carried out before any isolation is effected. The safeguards specified by the risk assessment team must be strictly observed; if this is not possible, the work must be deferred until the process can be shut down.

4.2.6.5 Other Isolation Devices

4.2.6.5.1 Devices such as mechanically expanded plugs or stopple bags will not be used as primary forms of isolation.

4.2.6.5.2 Conventional mechanical plugs or stopple bags may be used as a vapour seal to contain or direct to vent any small amounts of vapour at atmospheric pressure only. Flammable vapour monitors must be used where the presence of vapour could create a hazard.

4.2.6.5.3 When using mechanical plugs, open vents and drains located behind plugs to prevent a vacuum or increase in pressure.

4.2.6.5.4 In all cases, contingency measures against injury or damage caused by sudden ejection of the plug or bags must be put in place.

4.2.6.6 Appendix 2 defines the recommended standards under which valve isolation should be used without the need for additional risk assessment.

4.2.6.7 When referring to Appendix 2, small pipe work, including instrument lines of 3/4 inch nominal bore and below can be treated the same as for pressures less than 150 psi and isolated accordingly.

4.2.7 Isolation Planning

4.2.7.1 Plant and equipment isolation requirements should be identified early in the work planning cycle.

4.2.7.2 The need for good access in areas where isolations are to be effected must be taken into account.

4.2.7.3 Isolations should be as close to the vessel or work-site as possible.

4.2.7.4 Where isolation is required to permit any breaking of containment, systems shall be hydrocarbon freed by draining and flushing with water or by venting and purging by Nitrogen once isolation integrity has been established by Pressure Build Up (PBU) or Pressure Fall Off (PFO) testing.

4.2.7.5 Contingency plan should be in place before the isolation job with consideration for:

4.2.7.5.1 Breaking joint carefully - if leakage, boxing up and reviewing position.

4.2.7.5.2 Identifying and knowing the location of next upstream block valves, etc;

4.2.7.5.3 Identifying and knowing the location of local ESD facilities.

4.2.8 Risk Assessment

4.2.8.1 The assessment team must specify appropriate safeguards which may replace or be in addition to those listed in the table shown in the appendix.

4.2.8.2 The team must be satisfied that these safeguards will reduce the risks to an acceptable level before the task requiring isolation is permitted to proceed.

4.2.8.3 For more information on Risk Assessment, please refer to the “Risk Assessment Practice” within the Safety Manual.

4.2.9 Lockout and Tag out (LO/TO)

4.2.9.1 The authorized Performing Authority (PA) and Area Authority (AA) who applies an equipment lockout must notify all affected personnel and all personnel whose work operations are or may be in the area. They should be reminded of any prohibition relating to attempts to restart or re-energize the equipment.

4.2.9.2 The Area Authority should identify the isolation mechanism to be used and how the lockout will be applied.

4.2.9.3 If the equipment is operating, it should be shut down in the normal manner.

4.2.9.4 The isolation mechanism may then be applied e.g. Main power switch turned OFF, valves closed or other energy isolating devices applied.

4.2.9.5 Stored energy such as that in capacitors or hydraulic, air, gas, steam or water pressure accumulators must be reduced to a non-hazardous level.

4.2.9.6 If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation must be continuous throughout the work.

4.2.9.7 The IA must then lock out the energy isolating mechanism in the appropriate position with an approved personal lock or the use of the Pro-Lock system.

4.2.9.8 The IA will attach a tag to the lock which indicates “DANGER - DO NOT START”, which gives the reason for the lockout, and which he will sign and date.

4.2.9.9 The lock/tag number shall be recorded on the associated ICC which will then be signed by the IA.

4.2.9.10 A separate ICC shall be raised and all ICC's and PTW's cross referenced on the associated ICC/PTW's. An ICC cannot be signed off and closed until all referenced PTW's are signed off and closed.

4.2.9.11 Valve handles will be removed if practical or be integrated as part of the device being locked out.

4.2.9.12 After ensuring that all personnel are clear, each authorized individual applying an isolation device (lock or Pro-Lok) must witness a test to confirm the equipment is properly isolated and will not operate.

4.2.9.13 If the isolated equipment can not be tested, then this must be highlighted on the Risk Assessment and the AA, PA and IA must ensure all sources are de-energized.

4.2.9.14 Only when the above steps have been taken may work commence.

4.2.9.15 At the beginning of each shift, or after any prolonged absence from the job, any team who has equipment locked out will check the equipment and the disconnecting device to determine that all equipment is safe for work and has not been returned to service in their absence. AA to determine if and when further checks are required.

4.2.10 Lock out / Tag out devices

4.2.10.1 Chain and Keyed lock

4.2.10.1.1 Keyed lock is allowed for the isolation of mechanical equipment, i.e. valves with its different types and sizes.

4.2.10.1.2 The IA should retain the key at all times and not pass it to another person without clear discussion with that person and the Area Authority.

4.2.10.1.3 If more than one group is working on the same item (including different maintenance teams) each authorized person from each team will place a lock on a multiple hasp and will sign and date the tag.

4.2.10.2 Pro- lock Device

4.2.10.2.1 This isolation device consists of a colour coded hasp (multi-lock) and polypropylene coated steel cable. The different colours allow easy visual identification of or differentiation between each isolation case.

4.2.10.2.2 The following **colour-code** is used:

4.2.10.2.2.1 Green: For long-term or permanent locked open equipment for normal operation function of the device, i.e. isolation valves for PSV piping systems.

4.2.10.2.2.2 Red: For long-term or permanent locked close equipment for normal operation function of the device, i.e. manual ESD bypass valves.

4.2.10.2.2.3 Yellow: For short-term or temporarily day by day operations and maintenance, i.e. values used to isolate pumps for PM's.

4.2.10.3 Tags:

4.2.10.3.1 All valves, spades blank flanges, locks and pro-lock used for isolation purposes must be identified by means of labels.

4.2.10.3.2 The tag number of the isolation device must be marked clearly on the Isolation Confirmation Certificate and the ICC number clearly marked on the label.

4.2.10.3.3 The plastic identification tag must be filled with name of the isolator, the concerned ICC number and the equipment or valve ID and attached to the chain lock or Pro-Lock device.

4.2.11 Restoring Equipment to Service

4.2.11.1 After the work is complete, the relevant lock out devices may be removed by the person who installed the lock out.

4.2.11.2 In the event a person is unavailable to remove his lockout device, the following procedure must be followed:

4.2.11.2.1 Verify that the person is not at the facility.

4.2.11.2.2 Ensure the person knows the lock/tag will be removed before removing the lock and resuming work at the facility.

4.2.11.2.3 Jointly the site AA and PA may then remove the lock/tag.

4.2.11.3 The last person removing their lock and releasing the “Do Not Operate” tag will notify the AA that the repairs are complete and ready for service.

4.2.11.4 Contractors are not authorized to return plant or satellite equipment to service. However, the Area Authority may authorize contractors to return field equipment to service.

4.2.11.5 The PA restoring energy to the equipment must :

4.2.11.5.1 Inspect the work to ensure that nonessential items have been removed.

4.2.11.5.2 Ensure that the equipment components are operationally intact.

4.2.11.5.3 Check the work area to ensure all personnel are safely positioned or removed from the equipment.

4.2.11.5.4 Notify all affected personnel.

4.2.11.6 Post Integrity Checks

4.2.11.6.1 After hydrocarbons or hazardous utilities have been introduced, an initial visual check of joint integrity shall be made for all broken joints and any other joints that may have been disturbed. Further checks shall be carried out every 12 hours until the plant has reached its normal operating pressure and temperature. Checks shall be carried out for at least 2 days.

4.2.11.6.2 Normally Unmanned Installations

4.2.11.6.2.1 It is recognised that for NUIs where a permanent presence does not exist, the ability to monitor will depend on the length of stay and timing of subsequent visits. A flange tagging process should still be applied and the monitoring process followed as far as is practicable, with a final check and removal of the flange tags being made at least on the next return visit to the site

4.2.12 Sanction to Test

4.2.12.1 Certain work, such as testing pumps, commissioning equipment, requires the testing or running of equipment prior to completion of the job and full or partial removal of specific isolation devices.

4.2.12.2 Where this is required a Sanction to Test (STT) is requested. This operation must be tightly controlled by the AA and IA

4.2.12.3 The isolated points required to be temporarily de-isolated must be reviewed with the AA and IA and then the permit and all other associated permits or certificates affected by the STT should be suspended.

4.2.12.4 Once the AA has given approval for the STT, the IA can de-isolate the relevant isolation points and list such de-isolations on the ICC form. Once the initial de-isolation has taken place then any associated permits which were withdrawn, can potentially be reissued if considered safe to do so by the AA.

4.2.12.5 On successful completion of the temporary test then the isolation points can be re-isolated to allow continued work under the original permit. This approval, de-isolation and subsequent re-isolation must be recorded on the ICC.

4.2.12.6 Once isolations are re-instated, then the system protected by the isolations must then be verified and proven safe.

4.2.12.7 The steps for STT a specific pipeline or equipment must be described and included in the work package.

4.2.13 Isolation Confirmation Certificate

4.2.13.1 The isolation confirmation certificate must perform the following functions:

4.2.13.1.1 Identifies the plant concerned and the reasons for isolation.

4.2.13.1.2 Authorizes isolation by disciplines.

4.2.13.1.3 Records the complete list of isolations/valve tag numbers used for a particular task.

4.2.13.1.4 Confirms that the isolations have been effected.

4.2.13.1.5 Authorizes and records de-isolation on completion of the task.

4.2.13.2 A copy of the complete list of isolations/valve tag numbers and/or a marked up P&ID or other suitable drawing must be attached to the procedure, together with a record of the formal risk assessment as required.

4.2.13.3 Long term isolations should be periodically reviewed monthly and listed in the Long Term isolation register.

4.2.13.4 See the Appendix 1 for ICC form.

4.2.14 Monitoring

4.2.14.1 The monitoring as described below is the responsibility of the AA.

4.2.14.2 **Monitoring**

4.2.14.2.1 Monitoring Isolation Integrity - The integrity of each isolation point shall be monitored at suitable intervals to detect any actual leakage or deterioration in condition caused, for example, by vibration or disturbance (or changing pressure upstream). This monitoring may involve partial testing of valved isolations .The minimum recommended frequency of monitoring is once per shift and immediately prior to breaking containment. The results of any monitoring of isolation integrity shall be recorded and will form part of the shift handover.

4.2.15 Modifications & new facilities

4.2.15.1 The design of all modifications and new facilities shall include a review of the provision of means of isolation for maintenance.

4.2.15.2 The approval procedures for all modifications and new facilities shall include a review of their impact on existing isolation facilities and procedures.

4.2.16 Audit

4.2.16.1 Independent audit of isolation methods and procedures shall be undertaken by the Gm's and AGM's using the ICC audit form.

Furthers systems audits to be conducted jointly by the HSE department and the appropriate affected department.

ISOLATION CONFIRMATION CERTIFICATION

Registry No

Registered at the CCR _____
CRO

Plant/System to be isolated

Sheet of

Module Location

Reason for isolation

Drawing attached ☐

Blanking schedule, P & ID attached ☐

	Sign Off	Sign Off	Sign Off	Sign Off	Sign Off

Connected permits to
Work and Entry Cert.
Overlapping ICCs

Isolation Request

I, Area Authority, declare that the above plant/system is in a safe condition to be made.

I request that the plant to be isolated in the following ways:
Valve ☐ Positive ☐ Control ☐ Electrical ☐ tick as req'd
Signed _____ Designation _____ Date _____ Time ___ Hrs

De-Isolation Request

I, Area Authority, declare that the work carried out under this certificate is COMPLETE, and all connected permits to work and Entry Certificate have been CANCELLED. I request that the plant/ system be de-isolated

Signed _____ Designation _____ Date _____
Time ___ Hr

Insert yes/no to indicate means of isolation sheet if required	Open	Closed	Disconnected	Spades	Blanked	Labelled	Locked	Lock/Tag No.	Isolating Authority (sign each item)	Amendment to Isolation: Area Authority, authorize the following items to be De-isolated / Isolated as initiated below. I, Isolating Authority, certify that the following items have been De-isolated / Isolated as counter indicating below									Isolation Authority (Sign each time)
									isolated		De	1	De	1	De	1	De	1	De-isolated
VALVE ISOLATION																			
										A									
										A									
										IA									
										AA									
										IA									
										AA									
										IA									
										AA									
										IA									
POSITIVE ISOLATION																			
										AA									
										IA									
										AA									
										IA									
										AA									
										IA									
										AA									
										IA									
										AA									
										IA									
CONTROL ISOLATION (MECHANICAL)																			
										AA									
										IA									
										AA									
										IA									
										AA									
										IA									
										AA									
										IA									

Insert Yes/No To Indicate Means Of Isolation Sheet If Required	Isolate	Fuse Removed	Disconnected	Earthed	Proved Dead	Labelled	Locked	Lock/Tag No.	Isolating Authority (sign each item)	Amendment to Isolation Area Authority, authorize the following items to be De-isolated / Isolated as initiated below. I, Isolating Authority, certify that the following items have been De-isolated / Isolated as counter indicating below									Isolation Authority (Sign each time)
									isolated		De	1	De	1	De	1	De	1	De-isolated
CONTROL ISOLATION (ELECTRICAL)* Record position of inhibits/overrides in the isolation list																			
										AA									
										IA									
										AA									
										IA									
										AA									
										IA									
CONTROL ISOLATION* Record position of inhibits/overrides in the isolation list																			
										AA									
										IA									
										AA									
										IA									
										AA									

I, Area Authority, declare that all isolations have been removed from the plant/System specified on this certificate. Normal operations may be safely resumed.

Signed _____ Designation
Date _____ Time _____ Hrs

Registry of ICC Cancellation

(a) Both copies of ICC and attached documentation returned to CCR.

(b) Notation of ICC cancellation and plant's availability to return to normal operations made in the permit register

Signed _____.Designation _____ Date _____ Time _____Hrs

Appendix 2 – Flow Line Valves' Standard

Recommended Standards for Isolation			
Operating Pressure / Fluid Type	< 150psi	> 150psi < 800psi	> 800psi
Process Fluids	V = SVI I =SVI + A	V = SVI + B I = DBB + B	V = DBB + A I = DBB + B
Hazardous Utilities	V = SVI I =SVI + A	V = SVI + B I = DBB + B	V = DBB + A I = DBB + B
Non-Hazardous Utilities	*V = SVI* I = SVI	V = SVI + A I = SVI + B	V = SVI + B I = SVI + A

Cods:
This is the valving required to permit you to install blank flanges and spades (Positive Isolation)
IThis is the valving required to permit you to carry out intrusive maintenance without positive Isolation.
Plus:
A Use mandatory additional safeguards as on list A (Low Risk)
B Use mandatory additional safeguards as on list B (High Risk)

Mandatory Safeguards	A (Low Risk)	B (High Risk)
Gas test at intervals (Level 2)*		Y
Continuous gas monitoring (Level 3)*	Y	Y
Pressure build – up test	Y	Y
Regular monitoring of Isolation	Y	Y
Control / Prevent near by work	Y	Y
Radio link to CCR when breaking containment		Y
Develop contingency plan against leakage		Y
Identity back-up isolation valve, shutdown system. Etc.		Y
Minimize task time		Y
Portable fire fighting equipment to be readily available *		Y
Minimize possibility of plant disturbance		Y
Consider other safeguards. E.g.:		
Prevent other work which might affect plant stability		
Use additional mechanical ventilation		
Fire water / standby man		
Prove operation of F&G detectors and ESD systems *		
Reduce operating pressure		
Reduce potential leak inventory		
Change direction or reduce size of leak path		

Improve access	

Notes:
1. * Indicates that this safeguard does not apply to non-hazardous utilities
2. If the recommended standards, including all mandatory safeguards, cannot be applied formal risk assessment must be undertaken.

Pipe work at ¾" N.B. and smaller to be treated as for pressures < 150 PSI

5. Confined Spaces

PJ – HSEMSP 4.4.6.13

5.1 Purpose.

Defining the operations and operational activities which have Significant Impact on High Occupational Risk, and the followed methods to control it.

5.2 Scope.

Entry into confined spaces and special areas are operational activities which affect the HSE.

5.3 References.

3.1: ISO 14001:2004
3.2: OHSAS 18001:2007
3.3: PETROJET's HSE Manual
3.4: Law 4/1994 for environment
3.5: Law 12/2003.

5.4 Definitions.

Confined space means:

1. Large enough and so configured that an employee can bodily enter and perform assigned work.
2. Has limited or restricted means for entry or exit; and
3. Is not designed for continuous employee occupancy.

5.5 Procedure and Responsibilities

5.5.1 **The** HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSE and issue the instructions concerning it.

5.5.2 **The** concernedDepartments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks.

5.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

5.5.4 Making sure that the work locations provide the HSE correct conditions and that operations of starting and finishing operating as well as the contingency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

5.5.5 As for operations of obvious Occupational Risk .the employees should be qualified and trained to execute it, according to the operating Work Instruction.

5.5.6 Suppliers and contractors should be notified by the proceduresand requirements of PETROJETHSE System related to their dealings with the company, within the description clarified in the supply order.

5.5.7 **Monitoring** andmeasuring operations which affects the HSE, according to the HSE Monitoring and MeasurementsProcedure.

5.5.8 The HSE Manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSEobligations and other requirements.

5.6 Entry into Confined Spaces and Special Areas

5.6.1 PURPOSE

The purpose of this Instruction is to provide instructions for those responsible for the entry of personnel into vessels and confined spaces on the instructions and safeguards necessary to work in such areas.

5.6.2 SCOPE

This Instruction is applicable to all situations where the HSEManagement Team is responsible for the implementation of a Safety Management System at site.

5.6.3 RESPONSIBILITIES

The Construction Management is responsible for its authorization, implementation and liaison with the concerned Client.

5.6.4 APPROACH

5.6.5 General Requirements

Work Permit (Confined Space)

Refer to PTW procedures

5.6.6 Instructions

Assessment: refer to HIRARC procedure.

ISOLATION: refer to lock out tag out procedure.

Testing

Testing of the confined space including new constructed vessels must be carried out before it is certified as being safe to enter, or before safety precautions to be taken upon entry are specified.

Tests must check for the presence of: -

- Gas or fumes
- Chemical deposits
- The adequacy of the supply of oxygen.

The use of the correct test method is important. Portable gas, oxygen and H2S are supplied for this purpose.

Precautions during Work - Entry without Breathing Apparatus

When work is being executed inside a confined space and Breathing Apparatus is not being worn, an adequate supply of breathable air must be maintained. The purpose of this is to dilute any gases, etc. which might be evolved from the operation, from deposits, seams and also to provide fresh air for the person or persons inside.

Precautions during Work - Entry where Breathing Apparatus is Necessary

Breathing Apparatus should be well fitting and worn properly. When using an air-line type of breathing apparatus, filtered air is taken from a supply at such a rate that a positive pressure is maintained inside the face-piece.

Apparatus of the Canister Respirator or Cartridge type **MUST NOT**be used for any of the operations described in this instruction. Such equipment does not provide adequate protection against high concentrations of contaminants, and the equipment is useless in atmospheres where there is a deficiency of oxygen.

Rescue

Equipment and trained personnel shall be readily available for rescue purposes at all times when a person is inside a confined space.

The equipment available shall include additional sets of Breathing Apparatus, lifelines , resuscitation apparatus and means of communications . An attendant outside the space must tend the lifeline.

The person outside must be in constant attendance when work is being done inside the confined space, and that person must be capable of pulling the person, inside the space, out of it in case of emergencies (See appendix 3 for recommended equipment).

Where limitations on entry have been specified, these must also be applied to entry for the purposes of rescue. If, however, entry has been allowed without Breathing Apparatus, and the person inside has been overcome, it must be assumed that entry for rescue is unsafe without Breathing Apparatus.

The attendant and men likely to form a rescue team must be adequately trained in the risks involved and in the use of Breathing Apparatus, lifelines, resuscitation apparatus and artificial respiration. Oxygen **MUST NOT**be used to improve the atmosphere inside a confined space after a person has been overcome.

The Medical Department should be made aware of all Confined Space Entry jobs including equipment and its location.

Cancellation of Permit

A Work Permit must be cancelled when operations to which it refers have been completed. It must be returned to the person responsible by the person to whom it was issued, who must sign a declaration that all personnel and equipment have been removed from the confined space / area, and personnel warned that the space is no longer safe for entry.

Check of Permits

The HSE Manager shall personally carry out sample checks on the operation of Work Permit system to ensure that no laxity develops in the way permits are completed, or in the carrying out of specified isolation or other precautions. Reports on these checks should be brought to the attention of the Area Authority and the Assistant General Manager (Project Fabrication) and may form a basis for discussion by a joint consultative committee.

5.6.7 ASSOCIATED HSE INSTRUCTIONS

PJ Permit to Work Instruction

5.6.8 REFERENCE DOCUMENTS

HSE - Technical Data Note - Entry into Confined Spaces

6. Emergency Preparedness and Response

PJ – HSEMS 4.4.7

6.1 INTRODUCTION

The purpose of this Emergency Response plan is to define the procedure of the mobilization of personnel and equipment and the action required. It defines the responsibilities of named personnel, in order to prepare for any emergency that may arise in order to ensure the following priorities.

- Safeguard life
- Protect company assets
- Protect the Environment
- Resume normal operations as soon as possible
- Maintain the company Public Image.

6.2 Scope

The procedure outlines the ways to be implemented for the mobilisation of personnel who may be required to handle any emergency event while carrying out and sets out the following control procedures:

- Line of communication
- Emergency classification
- Emergency response

6.3 Classification of Emergencies

The various types of emergency have been classified and in general each type will require a different response and remedial actions, involving different people and organisational structures. By classifying the types of emergency it is possible to ensure that the people who are required to be informed and told with the minimum of delay.

The Emergency classifications are as follows.

- Personnel
- Death or serious injury
- Minor injury
- Vehicle accidents
- Asset Emergencies
- Damage to asset/equipment
- Fire
- Gas leakage
- Oil Spill
- Others.

6.4 Telephone contact Numbers.

During any emergency, it is essential that good communications be established between the site and all other interested parties. It shall be the responsibility of the area Manager that these are set up using the site or camp facilities as appropriate.

6.5 Emergency Response

In order to facilitate the quick response required for an emergency situation the form(PJ-HSEMSF-4.4.7-04) should be implemented.

6.6 Personnel

Death or Serious Injury

The most senior person on site will

1. Ensure that First Aid is administered to the injured party
2. Ensure that there is no further risk of injury to other personnel
3. Inform HSEGM.
4. Start investigation in to circumstances of event.

HSE GM will:
Obtain full details of injured/dead persons
Advise the Managing Director.

6.7 Other Injuries

The most senior person at site will:
Ensure that First Aid is administered to the injured party
Ensure that there is no further risk of injury to other personnel
Inform HSE ASS. General manager and pass on information/advice as necessary.
Start investigation into circumstances of event

6.8 emergency plans

Each site belong to petrojet should develop EMERGENCY plan & make a periodically drill to ensure that all labours and staff inside the site understand their roles in case of emergency.
Emergency plan and measuring performance should contain at least the following items:-

1) The scope and purpose of the emergency plan
2) Identify the potential for emergency situations and to ensure that all labors are trained on these situations and understanding their roles and responsibilities and emergency procedures by initiate drills in a periodically basis (PJ-HSEMSF-4.4.7-03)
3) The means, ways, responsibilities and flow of communications in case of emergency and ensure them effectiveness on regular basis (PJ-HSEMSF-4.4.7-01)
4) Ensure effectiveness of emergency equipment by testing them in regular basis (PJ-HSEMSF-4.4.7-01)

7. Compressed Gas Cylinders

PJ - HSEMSP 4.4.6.21

7.1 Purpose.

Defining the operations and operational activities which have High Occupational Risk, and the followed methods to control it.

7.2 Scope.

Handling Of Compressed Gas Cylinders is one of the operational activities/ aspects which affect the HSE.

7.3 References.

3.1: ISO 14001
3.2: OHSAS 18001
3.4: Law 4/1994 for environment
3.5: Law 12/2003.

7.4 Definitions.

None

7.5 Procedure and Responsibilities

7.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSE and issue the instructions concerning it.

7.5.2 The concerned Departments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks

7.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

7.5.4 Making sure that the work locations provide the correct conditions and that operations of starting and finishing operating as well as the contingency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

7.5.5 As for operations of obvious Occupational Risk, the employees should be qualified and trained to execute it, according to the operating Work Instruction.

7.5.6 Suppliers and contractors should be notified by the proc eduresand requirements of PETROJET. HSE System related to their dealings with the company, within the description clarified in the supply order.

7.5.7 Monitoring and measuring operations which affects the HSE, according to the HSE Monitoring and Measurements Procedure.

7.5.8 The HSE Manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSE obligations and other requirements.

7.5.9 All the machines and equipments in the company are subject to Periodic Preventive Maintenance.

7.6 Handling Compressed Gas Cylinders

7.6.1 PURPOSE

The purpose of this Procedure is to ensure that those involved in the storage and handling of compressed gases avoid the potential dangers of fire and personal injury involved.

7.6.2 SCOPE

This Procedure is applicable to all situations where PETROJET Management is responsible for the implementation of a Safety Management System at site.

7.6.3 RESPONSIBILITIES

PETROJET Management is responsible for its authorization and implementation.

7.6.4 APPROACH

7.6.4.1 Storage

Ventilation

Storage areas must be well-ventilated top and bottom.

Exposure

Cylinders stored in the open must be protected in hot weather the direct rays of the Sun. Tarpaulins or any other cover must not be used in direct contact with the cylinders.

NO SMOKING signs must be displayed and strictly enforced.

Cylinders must be protected from rusting and corrosive conditions.

Heating and Lighting

Direct space heating must not be allowed in stores where compressed gas cylinders are kept.

Lighting for stores containing acetylene or other combustible gas cylinders should either be:

- Approved flameproof type, or
- Outside the building, so that the interior is lit
- Electric switches must be flameproof or placed outside the storeroom.

Construction

Storage areas must be of fire resistant construction and so designed and situated that in the event of a fire the cylinders are easily removable.

Layout

Full and empty cylinders must be kept apart by a minimum distance of 25ft and FULL and EMPTY notices displayed to prevent confusion and mistakes.

Oxygen and combustible gases such as acetylene must not be stored together in an enclosed space. If in the same area, they must be kept apart and be separated by partitions and well ventilated.

Acetylene cylinders must always be stored and used in an upright position.

Cylinders being supplied to site must not be accepted without protective valve covers.

When storing cylinders upright they must be secured so they will not fall. They must not be propped against a wall or bench; a suitable cylinder stand must be used.

If cylinders are stacked horizontally large wedges must be used at each end of the stack. Large cylinders must be at the bottom and the stack must not be more than four high. (This applies to Oxygen cylinders only)
Cylinder protective caps must be installed on stored cylinders.

Misuse of Cylinders

Cylinders must not be used as rollers, work supports, or jacks.

7.6.4.2 Exposure to Heat

If a cylinder is exposed to heat, the cylinder wall may be weakened and at the same time the gas content will increase in pressure. This may result in violent rupture of the cylinder. If the contents are combustible the resulting fire will be serious.

Should the cylinder become accidentally overheated or damaged the suppliers must be notified immediately and the cylinder must be taken out of service (See paragraph 'Excessive Heat' below). Damaged cylinders should, where possible, be isolated from undamaged cylinders. They should be clearly marked 'Damaged-Do Not Use'.

Oil, Grease and Other Contaminants; Oil or grease ignites violently in the presence of high-pressure oxygen and an explosion may result. Cylinders and fittings must be kept away from all sources of contamination such as oil barrels, overhead shafting, cranes or drive belts.

Personnel must not smoke, wear oily clothes, or have any exposed light in any place where compressed gases are stored. No Smoking signs will be placed and strictly enforced.

Measures must be taken to prevent grit, dirt of any sort, oil, grease or water from entering cylinder valves. They must be stored well clear of all sources of corrosion such as battery charging areas.

7.6.4.3 Handling and Use of Cylinders

Handling and Transport

Cylinders must not be subjected to undue strain by blows or mechanical damage.

Cylinders must not be allowed to drop or come into violent contact with each other.

Cylinders shall be so conveyed as to not project beyond the sides or ends of the Vehicle. Adequate means shall be taken to prevent cylinders falling off the vehicle. They must not be loaded loosely so that they come into violent contact with each other when the vehicle moves.

A rope or nylon sling must not be used to lift single cylinders. A single cylinder jacket must be used. If more than one cylinder has to be handled by a crane a properly designed cradle with chain or wire suspension must be used.

Cylinders must not be allowed to come into contact with electrical apparatus or live wires. (Arcing may occur resulting in damage to the cylinders).

Care of Cylinders in Use

Personnel must not handle oxygen cylinders, valves or any other fittings with greasy hands, gloves or rags.

Cylinders and valves must be kept clean. Grit, dirt, oil and dirty water must not be allowed to enter the cylinder valve sockets; otherwise it will be impossible to prevent equipment from leaking at the joints.

Loose dirt must be cleared by 'sniffing' some gas through the cylinder valve momentarily before attaching regulators or fittings, i.e. by opening and closing. Ensure all personnel stand clear of cylinder valves before clearing outlet sockets.

Only the supplier's standard keys may be used for operating cylinder valves. The leverage of keys must not be increased and long leverage spanners or badly worn keys must not be used. A cylinder with a broken spindle must not be used, otherwise valves may be damaged and the cylinder rendered useless. Faulty apparatus must not be attached to the cylinder or allowed to remain if it is damaged after attachment.

Personnel must not lubricate any valve or fitting, and must not use any white or red lead or any other jointing compound.

Cylinders must be kept away from sparks, flames or slag from welding or cutting operations.

Cylinder valves must be shut when work has to be stopped for more than a few minutes, or when the cylinder is empty.

Excessive Heat

Cylinders must not be subjected to heat which causes increased pressure and weakening of the cylinder wall.

If an acetylene cylinder is heated accidentally or by a backfire from the use of faulty equipment, it must be dealt with promptly as follows: -

- Shut the valve.
- Detach the regulator or other fittings.
- Take the cylinder into the open air and well away from any sources of ignition at once.
- Immerse in, or apply, water copiously to cool.
- Open the valve fully and keep cool with water until the cylinder is empty. As this may take several hours immediate contact should be made with suppliers for further advice.

Leaks

Care must be taken to avoid gas escape from the cylinder valve or apparatus attached to it with the associated hazard of a gas accumulation in a confined space.

Soapy water and a brush must be used to locate leaks - NEVER use a naked flame.

Reactions

The gas must not be allowed to contact material with which it reacts violently or explosively.

i) Acetylene

Acetylene can form explosive compounds in contact with certain metals or alloys, in particular those of copper and silver. Joint fittings or piping made of copper must not be used, acetylene must never be allowed to come into contact with copper or any alloy containing more than 70% copper.

In a confined space a small amount of acetylene or oxygen may create a dangerous condition, which will cause explosion or fire from a spark or naked light.

ii) Oxygen

Oxygen has no smell and whilst it does not burn, it supports and accelerates combustion. Care must be taken to avoid the risk of clothing or other flammable materials such as oil being ignited. Substances will burn fiercely in oxygen or where the atmosphere has been enriched with oxygen.

7.6.4.4 **Valves and Regulators**

Valve Operation

The cylinder valve must always be opened slowly. Cylinder valve spindles always have right-handed threads irrespective of whether the cylinder contains a fuel gas or non-combustible gas.

The cylinder valve must be closed sufficiently to shut off the gas. Excessive force must not be used.

Transport

Cylinders must never be transported with the regulators and hose attached, unless a proper trolley or carrier is used. When transporting by a trolley the cylinder valve must be shut before the cylinder is moved from place to place.

Regulators and Flashback Arrestors

Welding or cutting apparatus must not be used unless automatic pressure regulators are fitted to the oxygen and fuel gas cylinder complete with flashback arrestors.

When using acetylene from a generator, a hydraulic back pressure valve must be used.

It is unsafe to rely entirely on the use of a needle valve, as this does not prevent a reverse flow of gases towards the cylinders. Moreover the use of a needle valve in place of a regulator may cause the bursting of the hose if the gases are cut off at the blowpipe, as the hose will be subjected to cylinder pressure.

Before a regulator is put on to a full cylinder, the adjusting screw for regulating the pressure of output must be released otherwise there is a risk of damage to the regulator.

The threads on regulators and other auxiliary equipment must be the same as those on cylinder valve outlets. The outlets of industrial gas cylinder valves are screwed 5/8" BSP threads.

- Right-hand for oxygen and non-combustible gases
- Left-hand for acetylene, hydrogen and combustible gases

Connections that do not fit must not be forced.

Manifolds and Headers

Where cylinders are connected to manifolds or headers, such manifolds must be of proper design and equipped with one or more pressure regulator, and proper flashback arrestors.

Matching Equipment and Gases

Equipment must not be used for gases other than those for which it is intended. Coal gas, hydrogen, and acetylene/ propane regulators are all fitted with left-hand threads of the same size, but acetylene or propane regulators must not be used on coal gas or hydrogen cylinders that are filled to a higher pressure than is suitable for them.

7.6.4.5 Gauges

Only pressure gauges recommended by the suppliers may be used. Gauges for oxygen must be marked 'Oxygen' and must not be tested with oil. Gauges used to show contents of oxygen, nitrogen, coal gas or hydrogen cylinders must have a minimum dial reading of not less than 3,000 lb./in^2 (225 bar).

7.6.4.6 Hose

Blow back arrestors shall be fully utilized in lines. Any equipment brought onto Company property not fitted with blow back arrestors will be refused for use until adequate non-return adapters are fitted.

Only best quality hose is to be used. Inferior hose tends to harden, crack and leak which may cause fire internally when oxygen passes through it.

The hose must be firmly attached to the blowtorch and other connections by clips or other suitable means. Lengths of hose are supplied with the ends firmly attached to nipples having screwed unions suitable for connecting to standard regulator outlets and blowpipe inlets. These should be used in preference to any other hose.

Frequent accidents occur due to leakage or due to the supply hoses becoming loose or being blown off. Hose connections must be frequently examined. Lengths of hose must be joined by means of suitable connecting fittings when more than the standard length is required. Unnecessarily long lengths of hose shall not be used.

Cylinders must not be used to support the work, nor should the blowpipe flame be allowed to come into contact with the cylinders. The blowpipe, when alight must not be hung on the cylinder or on the regulators.

7.6.4.7 Light up Procedure

It is important that an adequate flow of fuel gas is issuing from the nozzle of the blowpipe or other apparatus before lighting up.

First ensure, before lighting the torch all material and equipment in the vicinity is totally protected.

Personnel must follow the following procedure: -

i) Set the regulators to the recommended working pressure.

ii) Keep the blowpipe nozzle away from any source of ignition (Pilot light, smouldering tow, etc.) until the fuel gas is flowing freely from the nozzle.

iii) The use of a spark lighter is recommended for lighting blowpipes.

iv) If the blowpipe flashes back on lighting up it is because:

1. The regulators are not set to the correct pressures, or,
2. A light has been applied before the flow of fuel gas is properly established.

v) If flame snaps out when the blowpipe is in use, it is because:

The regulator pressure and/or gas flows are incorrect, either too high or too low

The nozzle has been obstructed

The nozzle is held too close to the work

The nozzle has become overheated. Completely shut both blowpipe valves. Plunge the nozzle and blowpipe head in water. Make sure that the nozzle is tight before re-lighting the blowpipe. Check the regulator setting and cylinders pressures and re-light in accordance with the procedure given above

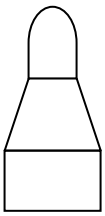
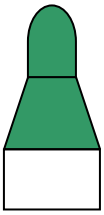
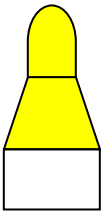
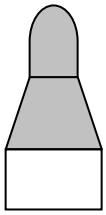
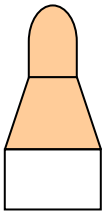
7.6.4.8 **General**

Personnel using compressed gas equipment must not abuse the equipment, i.e. using the torch as a hammer, and must strictly observe these procedures:

a. Inspect rubber hose periodically to see that it is free from cuts, cracks, burns, and worn places, and arrange it so that it cannot be cut by contact with sharp edges or corners, falling metal, sparks or the blowpipe flame.

. Gas cylinders are color coded to Egyptian Standard 1990 – 1898 as follows:

Colour code

Oxygen	Nitrogen	Argon	Carbon Dioxide	Acetylene
				
White	Green	Yellow	Grey	Maroon

Gas cylinders, the contents of which are not clearly identified should not be used.

ii) Use red hose for acetylene and other combustible gases, and is careful to see that they are never interchanged with other colours.

iii) Use hoses of equal length and do not coil any surplus hose around regulators or cylinders.

iv) Do not use odd bits of tubing. Copper or high copper content alloy must not be used in acetylene hose or other parts in contact with acetylene. Use a proper adapter.

v) Observe carefully the maker's instructions for lighting and using blowpipes.

vi) Do not use pressures in excess of those recommended or heavy duty high delivery regulators where only low pressures are required.

vii) Never attempt to light a blowpipe until sufficient time has elapsed after opening the blowpipe acetylene valve for the gas in the hose to normalize at the correct working pressure and all air to be blown from the hose.

viii) Follow the instructions given by the makers for:

- Lighting the equipment
- Operating it
- Procedure when dealing with a cylinder which is overheated, by a backfire or other incident Failure to carry out these instructions and precautions properly may cause the cylinder to heat up internally and burst.

ix) Do not site or use cylinders near the intake of an air compressor.

x) Always ensure there is a fire extinguisher, compatible with material, on hand for any potential fire.

7.6.5 ASSOCIATED SWM DOCUMENTS

PT-OHSAS-4.4.6-WI-WLD, Safe Instructions for Welding & Cutting

7.6.6 REFERENCE DOCUMENTS

BS 349 - Identification of Contents of Industrial Gas Containers

Egyptian Standard 1990 – 1898

8. Risk Management and Environmental Aspect

PJ - HSEMSP 4.3.1

8.1 Risk Assessment

8.1.1 INTRODUCTION

8.1.1.1 Purpose

8.1.1.1.1 The purpose of this Task Risk Assessment (TRA) process is to provide a method and practical guidance for assessing general health and safety risks from tasks carried out in the workplace. The management of Risk is an integral part of our operations within Petrojet. Risks involved in all activities must be reduced to "as low as reasonably practical (ALARP)", recognizing that some activities will always carry a residual risk.

8.1.1.1.2 Work will not be conducted without a pre-job risk assessment and a safety discussion appropriate for the level of risk.

8.1.1.2 Objectives

7.1.1.2.1 The objectives of this practise is to provide guidelines for use of a Level 1 and Level 2 Task risk assessment, the roles and responsibilities of the risk assessment team, and the documentation and associated processes to ensure all aspects of risk are considered and mitigations implemented to achieve the lowest possible risk level.

8.1.2 Level 1 & 2 Risk Assessment Definition

Level 1 (New PTW covers all significant hazards)

8.1.2.1 Is a broad overview of the task by a competent person (CP), to determine whether the hazards involved are significant, and if so, whether the risks will be controlled adequately by existing means?

Is a formal semi-qualitative assessment, which is required only when a CP judges that additional safeguards will be needed to minimise the risks.

Task risk assessment will normally be initiated by the AA or PA. The assessment must be carried out before the work is started.

Previously carried out L2 Risk Assessments (L2RA) can be used as a base document for repeat tasks.

Whenever a previous L2RA is re-used then it is critical that the details of the RA are reviewed to ensure that the scope of the task is still relevant, conditions have not changed and that the hazards and control measures are still appropriate. A new L2RA Front-Sheet must be completed, to capture details of the new review team.

8.1.3 ROLES AND RESPONSIBILITIES

8.1.3.1 Site Responsible Person

8.1.3.1.1 Ensuring that the TRA process is applied at sites within their area of responsibility.

8.1.3.1.2 Periodic internal reviews and/or audit of the operations of TRA.

8.1.3.1.3 Act as TRA Team Leaders to facilitate the TRA process.

8.1.3.1.4 Determining the appropriate level of Risk Assessment required to support any Permit to Work application and ensure the list of mandatory activities have proper L2 Risk Assessments.

8.1.3.2 Area Authority

8.1.3.2.1 For L1RA, AA identifies any significant hazards using the experience and judgment supported by a hazard checklist (permit and attachment within this document) and guidelines.

8.1.3.2.2 For L2RA, Participate and/or Lead a team to discuss the work scope, analyze and identify specific hazards associated with the work; define specific safeguards to implement before work starts.

8.1.3.2.3 Visit the worksite to ensure the potential hazards are recognized and listed on the L1 and L2 risk assessment.

8.1.3.2.4 Audit compliance with risk assessmentrequirements.

8.1.3.2.5 Trained in risk assessment as the Area Authority(AA) competent person

8.1.3.3 Performing Authority

8.1.3.3.1 Create the Permit and identify the hazards and control measures for the task being planned.

8.1.3.3.2 Visit the work site to complete the L1 and L2 risk assessments

8.1.3.3.3 Participate in the L2 risk assessment process

8.1.3.3.4 Roll out the output from the risk assessment process to the work crew.

8.1.3.3.5 Ensure the safeguards identified in the risk assessment are implemented

8.1.3.3.6 Trained in risk assessment as the PA competent person

8.1.3.3.7 Ensure all personnel working on the task:

8.1.3.3.7.1 Understand the hazards, risks and controls associated with the task

8.1.3.3.7.2 Participate and contribute in the Toolbox Talk

8.1.3.3.7.3 Are aware of their responsibility to feedback to the PA and AA of any potential hazards not identified in the L1 and L2 risk assessments.

8.1.3.3.7.4 Actively monitor the worksite and surroundings for changes

8.1.3.3.7.5 Ensure they are empowered to stop the job at any time if they are concerned about safety

8.1.3.4 TRA Team Leader

8.1.3.4.1 Lead the team in performing a Level 2 Risk Assessment

8.1.3.4.2 Ensure the team understands the assessment process

8.1.3.4.3 Take responsibility for maintaining the quality of the TRA

8.1.3.4.4 Ensure that the assessment team includes personnel with all the necessary experience, knowledge and competence for the task involved

8.1.3.4.5 Record the names of the team members, indicating their particular area of expertise.

8.1.3.4.6 Make proper arrangements for the group to work together.

8.1.3.4.7 Ensure all relevant documentation is present

8.1.3.4.8 Ensure sufficient time is allocated to allow rational decisions to be reached.

8.1.3.4.9 Ensure that the TRA includes a worksite visit

8.1.3.4.10 Ensure that all members of the TRA team have a full opportunity to contribute and that the details of the assessment are agreed by all team members

8.1.3.4.11 Ensure that the details of the assessment are accurately recorded

8.1.3.5 Individual TRA Member

8.1.3.5.1 Assessment must be carried out by a team composed of competent persons, who have the knowledge and experience relevant to the task.

8.1.3.5.2 Depending on the complexity and size of the task involved, a team as a minimum shall include the following people:

8.1.3.5.2.1 Area Authority (Team Leader)

8.1.3.5.2.2 Performing Authority

8.1.3.5.2.3 HSE Member

8.1.3.5.3 The Risk Assessment team must first ensure that they fully understand the task and its implications by visiting the worksite.

8.1.3.5.4 Actively participate in the TRA process

8.1.3.5.5 Help identify hazards and control measures to reduce the likelihood of an incident/accident occurring

8.1.3.5.6 Ensure they agree with the overall TRA before approval, ensuring that risks have been reduced to as low as reasonably practicable

8.1.3.5.7 Be trained in the TRA process

8.1.4 COMPETENCY, TRAINING AND AWARENESS

8.1.4.1 General

8.1.4.1.1 Ppersonnel involved in developing and implementing the Task Risk Assessment process shall be trained and proven to be competent. (Competent Person - CP)

8.1.4.1.2 The Area Authority and/or Line Supervisor shall ensure that the personnel involved in the activity have the correct competencies through records or requesting individuals to produce relevant certification.

8.1.4.1.3 The required training for team members includes:

8.1.4.1.3.1 Risk Assessment

8.1.4.1.3.2 Hazard Identification

8.1.4.1.3.3 Control of Work

8.1.4.1.3.4 Hot Work

8.1.4.1.3.5 Confined Space

8.1.4.1.3.6 Breaking of Containment

8.1.5 RISK ASSESSMENT

8.1.5.1 General

8.1.5.1.1 See Appendix C for complete instructions on how to conduct a risk assessment and complete the form.

8.1.5.1.2 Level 2 Risk Assessment will be documented and presented in dual language, Arabic and English.

8.1.5.1.3 A common way of assessing task risks is by the use of a permit to work. This is a well-established practice which is adequate for the majority of tasks. However, other types of assessment method must be used to cover those work situations where the permit is either not appropriate, or where the scale of the risk is such that the permit has to be supplemented by a more comprehensive approach.

8.1.5.1.4 The process of task risk assessment described in this Practice is a method for systematically examining an individual work task to identify the hazards, evaluate the risks and specify appropriate safeguards.

8.1.5.1.5 For task where mandatory L2 risk assessment is not required, the risk assessment flow-path to be followed is provided in Appendix B.

8.1.5.1.6 Non-permitted activities shall be conducted against an appropriate generic risk assessment or Job Safety Analysis (JSA) that addresses potential hazards and required precautions associated with the task. Such work activities can be documented using the risk assessment form in this Practice, see Appendix J.

8.1.5.1.7 Local procedures must therefore be validated periodically to determine whether any changes have occurred which might have an adverse impact on risk. If an accident or near-miss should occur while a procedure is in use, the whole procedure, including the risk assessment, must be reviewed before it is used again

8.1.5.2 The Risk Assessment Guidance

The risk assessment process will require either a Level 1 or 2 risk assessments to be completed.

8.1.5.2.1 Level 1

8.1.5.2.1.1 A Level 1 RA involves a review of the task by the PA in consultation with the Area Authority (AA) to identify the hazards associated with the task and appropriate control measures. The PA must complete the appropriate Work Permit

8.1.5.2.1.2 If the AA is not completely assured that the risks will be adequately controlled by these measures and feels a more rigorous assessment is required, they must inform the person in charge of the work and request a L2RA. This requirement should ideally be identified at the earliest opportunity.

8.1.5.2.1.3 The AA will review L1RA (Work Permit) along with any other documentation. The AA/PA will visit the worksite to ensure all hazards have been identified and controlled.

8.1.5.2.2 Level 2

8.1.5.2.2.1 A Level 2 Assessment must be carried out for the following **mandatory** activities:

8.1.5.2.2.1.1 Confined Space Entry

8.1.5.2.2.1.2 Naked flame hot work in all plant areas

8.1.5.2.2.1.3 Failure to meet minimum isolation standards

8.1.5.2.2.1.4 Deviation from existing policy, procedure or practice

8.1.5.2.2.1.5 Breaking Containment

8.1.5.2.2.1.6 Complex lifting operation involving multiple suspensions or lifting over live plant

8.1.5.2.2.1.7 Any activities involving potential exposure to hydrogen sulphide

8.1.5.2.2.1.8 Simultaneous operations

8.1.5.2.2.1.9 Over-side work, such as abseiling.

8.1.5.2.2.2 Where, as a result of Level 1, the Competent Person believes that significant risks exist which will not be adequately controlled without additional safeguards.

8.1.5.2.2.3 Where an element of emergency equipment is being removed from service (e.g. fire pump or lifeboat removal/maintenance)

8.1.5.2.2.4 A District may choose to specify certain tasks, known to be potentially hazardous, for which a Level 2 Assessment will always be carried out, regardless of ability to comply with any prescribed standards.

8.1.6 Acceptable Level of Risk

8.1.6.1 Where the residual risk is in the 7 to 11 range should only proceed with utmost caution.

8.1.6.2 Where the residual risk >=12, the task may NOT proceed. Either additional controls must be put in-place, or the task re-engineered.

8.1.6.3 Appendix G & H provides guidance to apply further actions based on the residual risk results.

8.1.7 Toolbox Talks

8.1.7.1 Toolbox talks will be carried out for all tasks, whether they are L1RA or L2RA.

8.1.7.2 A Toolbox Talk is a vital part of the process to ensure that the TRA and its associated documents are reviewed prior to the start of the job and are fully understood by all persons involved in the task.

8.1.7.3 Particular emphasis should be placed on those residual risks with a higher rating. It is also an opportunity for those involved in the work to raise any further concerns about the job and to identify any hazards not picked up in the TRA process.

8.1.7.4 If anyone at this Level identifies some additional hazards that have not been properly assessed or thinks the control measures are inadequate, then the job should not proceed until the TRA has been re-evaluated and appropriate controls identified to ensure the job is AS LOW AS RESONABLY PRACTICAL.

8.1.7.5 Keys to success of this step are:

8.1.7.5.1 Communication of the task, the hazards and what must be done to control them to every person involved in the task.

8.1.7.5.2 Language is critical, especially in complex technical tasks.

8.1.7.5.3 Risk assessments to be documented in English and Arabic.

8.1.7.5.4 The toolbox talk is held prior to work starting

8.1.7.5.5 Everyone understands the topics and hazards discussed

8.1.7.5.6 Everyone has the opportunity to voice concerns

8.1.8 MANAGEMENT OF RISK

8.1.8.1 Approval

8.1.8.1.1 On completion of the Risk Assessment, the Risk Assessment Front & Work Sheets must be attached to the work pack for the job. It must be reviewed and signed by the site manager before the permit is approved.

8.1.8.1.2 Should the AA feel that the task presents risks beyond his level of accountability, he must refer to his Manager for guidance, and if necessary request a more sophisticated analysis of the risks and mitigation than can be provided by the method described in this procedure.

8.1.8.2 Recording the Risk Assessment

8.1.8.2.1 Where a task is likely to be repeated, a record of the Risk Assessment should be retained for future reference.

8.1.8.2.2 Risk Assessments, which include hazards to the health of those undertaking the task, must be attached to the permit(s) for the job and retained for 12 months.

8.1.8.2.3 HSE Department will register and retain copies of risk assessments.

8.1.8.2.4 Where a Risk Assessment form is being re-used, it must be fully reviewed and a new front sheet created.

8.1.9 Appendices

8.1.9.1 A - Definitions and Abbreviations

8.1.9.2 B - Risk Assessment Flow Path

8.1.9.3 C - Risk Assessment Process

8.1.9.4 D - Level 2 Risk Assessment – Hazard Checklists

8.1.9.5 E - Hazard Effect

8.1.9.6 F – Probability Table

8.1.9.7 G - Examples of Control Measures

8.1.9.8 H – Residual Risk Measures

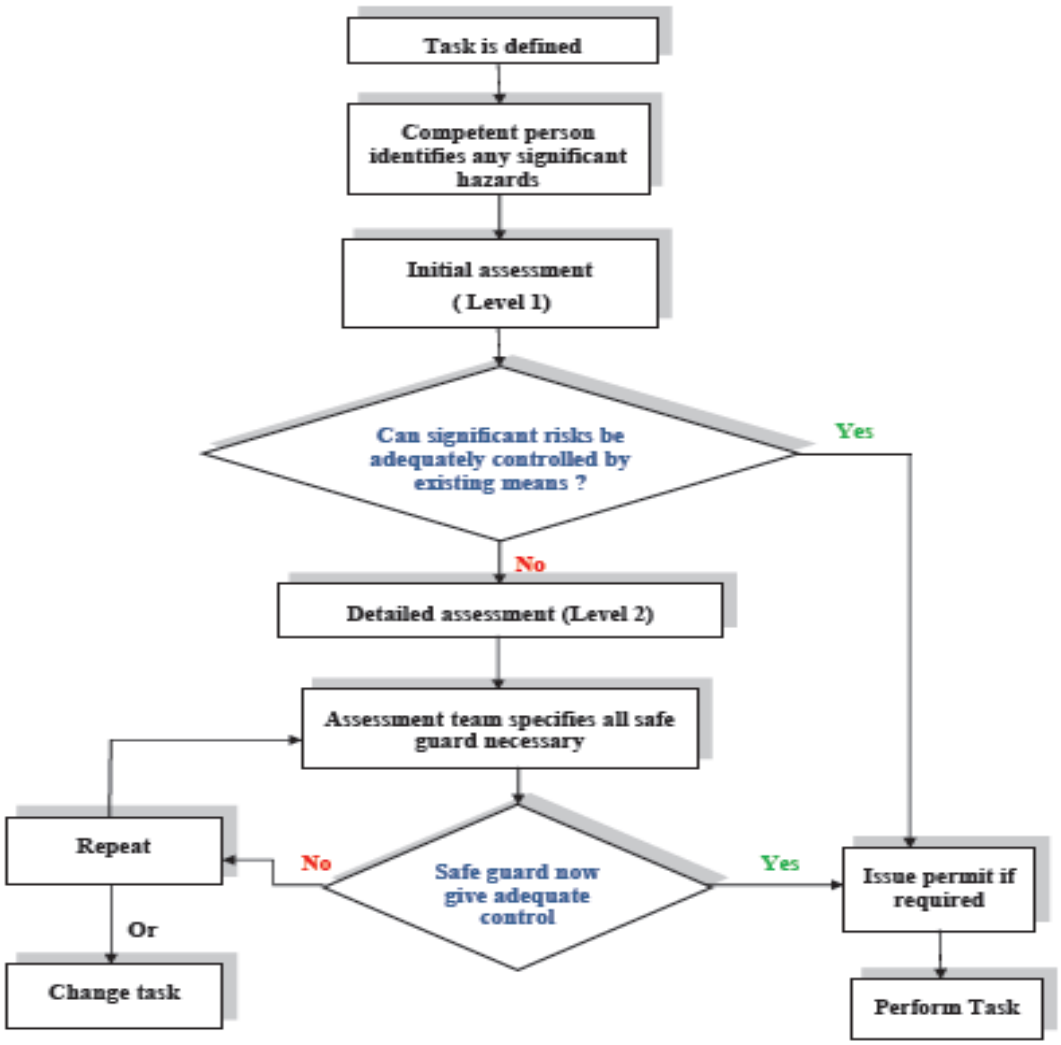
8.1.9.9 I – Risk Chart

8.1.9.10 J – Level 2 Risk Assessment Form

APPENDIX A: DEFINITIONS&ABBREVIATIONS

Confined Space Entry:	Where there is inadequate ventilation to dispel injurious or flammable fumes, vapour or gas or to provide sufficient oxygen. Also includes areas where access / egress are restricted.
Controls:	Steps taken to reduce either the probability or consequences, or both of a particular risk.
Hazard:	The potential for human injury or loss of life, damage to the environment or to material assets or a combination of these.
Hazardous Consequence:	The result when a hazard is realized.
Inhibition:	The isolation of the executive action of a protective system. Where practicable, this should not prevent the operation of the visual / audible warning system.
Isolation:	• Process Isolation involves the closing and locking of valves. This may include depressurising, flushing and purging, e.g. single valve isolations. • Positive Isolation involves the disconnection of plant, equipment and systems from sources of motive power, liquids and gases. • Electrical Isolation - The secure, disconnection and separation of a circuit, or item of equipment, from every source of electrical energy. This may involve electrical, instrument and communication isolations. • Long Term Isolation - An isolation that remains in place after permits cancellation, and recorded as “Long Term”.
Probability:	The chance of occurrence of an event. Probability can be expressed as a likelihood, frequency, class, rank etc.
Risk:	A combination of the likelihood of a hazardous event and the severity of the possible consequences of that hazardous event.
Risk Assessment:	The overall process of risk analysis and risk evaluation.
Risk Evaluation:	The process to support management decisions as to acceptability or risk reduction requirements by comparing the estimated risk against relevant criteria.

APPENDIX B: RISK ASSESSMENT FLOW PATH



Appendix C: Risk Assessment Process

The following explains the process of completing a L2 Risk Assessment. Use the risk assessment form, Appendix J, to record the findings of the assessment

i. Define the Task to be assessed

i.1. The task description detail must provide information on Who, What, Why, How and When the task will be performed.

ii. Identify the Hazards (What Can Go Wrong?)

ii.1. The team must fully understand the task and its implications, visiting the worksite, is MANDATORY, to see the physical layout of the area and current site conditions. Particular attention should be given to adjacent plant and equipment.

ii.2. The following aspects of the task should be examined:

ii.2.1. Characteristics of the plant integrity and systems directly involved, e.g. pressure, temperature, stability, voltage, H2S, toxic chemicals, foam, LSA scale, sand, wax, sludge, etc.

ii.2.2. Sensitivity of the location within the site/installation caused by proximity to other critical plant or systems, e.g. Drawings, HVAC intakes, flare header, explosive store, control room, NGL separator, risers, ESDV, structural support members, tankage, etc.

ii.2.3. Critical activities necessary to perform the task, e.g. lifting, draining fluid, inerting, isolation, flushing, entry into confined space, work at height, transport of materials, equipment and wastes, use of power tools, hot work, grinding, bolting, use of cables and hoses, etc.

ii.2.4. Possibilities of interaction between simultaneous activities within the task itself, or in other, unrelated tasks taking place nearby.

ii.2.5. Checklists are supplied Appendix D as a guide for reference purposes only. They should not be considered as being comprehensive.

iii. Identify the Hazard Effects

iii.1. The Team must then identify the Hazard Effects, which will be entered on the L2RA Work-Sheet. Hazard effects are the worst credible possible outcome of the hazard. The team shall refer to the Hazard Effects table in Appendix E. The Team should be as explicit as possible in the Hazard Effect details. It is important to consider personal injury, property damage and environmental impact.

iv. Existing Control Measures

iv.1. When doing a risk assessment, it is normal to assume that no controls are in place. For many tasks, some controls may be known before the risk assessment, and it is not realistic to think of the work being done without these controls, provided that:

iv.2. they are demonstrated as part of the task definition (e.g. planned isolations must have appropriate isolation certificate and marked-up P&IDs); and

iv.2.1. the controls are confirmed to be in place prior to the work being carried out

iv.3. Controls that may be included in the definition of the task include:

iv.3.1. procedures, operating guides, etc. (supported by a valid risk assessment);

iv.3.2. energy isolations confirmation certificate (including P&IDs)

iv.3.3. entry certificate
iv.3.4. scaffolding request; and
iv.3.5. Other risk assessments such as, manual handling, NORM scale.
iv.4. Work permits are used for recording the controls for individual work tasks, for controlling the interfaces between work activities and to gain the correct approvals to start a job. However, a work permit itself is not a control for an individual work task and should therefore not be included in the task description.

v. Evaluate the Initial Risk

v.1. Once the members are all familiar with the scope of the task to be carried out, the team should list all the significant hazards. This should be done during group discussion, with the team leader making sure that each team member is given adequate opportunity to express his views.
v.2. Appendix D is a checklist of hazardous agents, critical activities and hazard effects which can be used to support this discussion. Hazard checklists are also included in other HSE Practices wherever possible, to help identify hazards specific to that activity. These lists should not be regarded as comprehensive, however, and the main input should come from the competency, knowledge and experience of the team members.
v.3. The risks created by each hazard on the list should be evaluated according to:
v.3.1. The potential severity of the hazard effects, should anything go wrong, and
v.3.2. The probability of the hazard being realized.
v.4. The risks created by each hazard on the list should be evaluated according to:
v.4.1. The worst credible severity of the hazard effects, should anything go wrong
v.4.2. The probability of the hazard being realised and resulting in the specified hazard effect
v.5. It is important to consider property damage and environmental impact and not just personal injury
v.6. For each hazard the initial hazard effect (E) and probability (P) are defined based on the hazard and probability matrix shown in Appendix E & F.
v.7. The hazard effect (E) and probability (P) are then used to determine the risk (R), using the risk matrix**,** Appendix I.

vi. Determine the Additional Controls Required

vi.1. There are two types of control measures that will be identified from either the Level 1 or Level 2 TRA process:
vi.1.1. Prerequisite controls are those which must be in place prior to the job starting
vi.1.2. Supplementary controls are those which have to be applied during the job
vi.2. The prerequisite control measures must be implemented prior to the job going live. This includes any training and/or special briefing of the PA and work party according to an agreed plan of action.

vi.3. The supplementary controls, which will be applied during the job, must be understood fully by the PA and the work party before work commences.

vi.4. The AA must satisfy himself that Competent Persons have been allocated the work; the required controls are in place, any additional paperwork is complete, and that all the individual risks are reduced to AS LOW AS REASONABLY PRACTICAL.

vi.5. For L2RA, once the initial assessment of risk is complete, the team must work systematically through the list of Hazards and specify all the additional control measures needed to mitigate each associated risk, see Appendix G.

vi.6. The hierarchy of controls is applied in the following order;

vi.6.1. Eliminate

vi.6.2. Reduce (substitution, Engineering, Segregation)

vi.6.3. Manage or Administration (reduce exposure, Procedures)

vi.6.4. PPE – This must be the last control applied; remember that with PPE you are inside the hazard zone.

vi.7. Wherever possible, measures higher in the hierarchy should be used, providing they are reasonably practical and emphasis should be placed upon control at source. A combination of measures will usually be necessary in order to reduce the level of risk as low as reasonably practical. It should also be considered that when specifying controls, any associated risk that they bring with them needs to be assessed and controlled.

vii. Allocating Responsibilities for Control Actions

vii.1. Once the control measures have been identified, each should be allocated to, where possible, both a role and a specific individual.

vii.2. Action closed should not be completed until the work is about to commence.

viii. Re-evaluate the Risks for Acceptability – Residual Risk

viii.1. The team must then re-evaluate the risk for all those hazards for which controls have been determined. The new risk level should be determined and the team should consider whether the risk is now as low as reasonably practical.

viii.2. If the risk is not as low as reasonably practical, the review team must decide what further safeguards need to be put in place. The agreed new residual E, P and R are corrected on the TRA Worksheet, see Appendix H.

viii.3. The higher the perceived risk for any particular hazard, the greater should be the number and/or quality of independent controls, which the team specifies as necessary.

Consideration should also be given to the possibility of cumulative effects from the interaction of several different hazards.

viii.4. If the team considers that there are insufficient independent controls available, or that the controls are likely to be ineffective against any particular risk, that risk must be judged to be unacceptable, and the team leader must record this decision. The task must then be abandoned or referred to higher management.

viii.5. The team may also conclude that because of the complexity or degree of the risks involved, a more detailed engineering assessment is needed. In this case, the task must be suspended until the assessment is available.

viii.6. As a final check, the team should ask itself the following questions about the proposed task:

viii.6.1. Have all necessary control measures been fully and effectively identified?

viii.6.2. Is there a need for engineering change to eliminate or reduce risk?

viii.6.3. Is there a need to shutdown the plant or process?

viii.6.4. Is the residual risk rating acceptable?

Only at this point can the team judge whether as low as reasonably practical has been achieved.

Appendix D: Level 2 Risk Assessment – Hazard Checklists

A - Hazards associated with plant and equipment

Category	Type of Harm	Examples of Hazards
Mechanical	Trapping (crushing, pressing, drawing in and shearing injuries)	Two moving parts, or one moving part and a fixed surface Conveyor belt and drive V belt and pully Power press "In running nips" Mangle Guillotine Scissors Stapler , or Using hammer
	Impact (includes puncture)	Something that may strike or stab someone or can be struck against Moving vehicle, machine, ship, aircraft – including propellors and turbines Drill, lathe Sewing machine Hypodermic needle Pendulum Crane hook or load
	Contact (Cutting, friction or abrasion)	Something sharp or with a rough surface Knife, chisel, saw, etc. Fan blade Circular saw blade, including meat slicer Sanding belt Abrasive wheel Hover mower blade

Category	Type of Harm	Examples of Hazards
	Entanglement (rotating parts)	Drill chuck and bit Power take-off shaft Pipe threading machine Abrasive wheel

A - Hazards associated with plant and equipment (continued)

Category	Type of Harm	Examples of Hazards
Mechanical	Ejection (of work piece or part of tool)	Cartridge tool Hammer and chisel Abrasive wheel
Electrical	Shock/burn/fire/ Explosion Ignition sources	Electricity above 240v, Electricity 240v ,Electricity 110v Extra low volt electricity DC electricity, especially batteries when charging Static Batteries
Pressure	Release of energy (Explosion/injection/ implosion)	Compressed air Compressed gas Process fluid Steam Vacuum Hydraulic system

Category	Type of Harm	Examples of Hazards
Stored energy	Flying/Falling materials	Springs under tension Springs under compression Hoist platform cage Conveyor tension weight Raised tipper lorry body Counterweight Load carried by crane
Thermal	Burns/fires/scalds/ Frostbite	Hot surface Portable or fixed heater Welding flame/arc Refrigerant Steam Process fluid, heat transfer medium
Radiation Ionizing radiation	Burns, cancer	X Rays α or β radiation Neutrons

A - Hazards associated with plant and equipment (continued)

Category	Type of Harm	Examples of Hazards
Non ionizing radiation	Burns	Micro wave Radio frequency Laser Ultra violet Infra red
Noise	Hearing loss, tinnitus, etc.	Noise > 85 dB(A) continuous Noise > ? dB impact
Vibration	Vibration white finger, whole body effects	Pneumatic drill Driving mobile plant Using Jackhammer

Category	Type of Harm	Examples of Hazards
Stability	Crushing	Inadequate crane base Fork lift truck on slope Machine not bolted down Mobile scaffold too high Scaffold not tied
Overload/ Defective due to mechanical failure	Crushing	Crane overload Chain sling Eye bolt overload Scaffold overload Hopper overload Structure overload, esp extreme weather

B - Hazards associated with materials and substances

Category	Type of Harm	Examples of Hazards
FIRE/EXPLOSION Combustion	Burns	Timber stack ,Paper sore ,Grease , Plastic foam
Increased Combustion	Burns	Oxygen enrichment
Flammable substances (inc. Highly and Extremely Flammable) See also explosive below	Burns	Petrol, diesel, avgas Crude oil, natural gas, LPG, LNG, Hydrogen Carbon Monoxide
Oxidizing substance	Burns	Organic peroxide, other oxidising agents Potassium permanganate Nitric acid, Commercial explosive, Detonators
Gas explosions	Burns, structural failure	Flammable gas or liquid above its flash point in a confined space Similar in a congested area Sudden failure of pressure system containing flammable liquid (BLEVE)
Dust explosions	Burns, structural failure	Wood dust , Sulfur dust ,Coal dust, Flour Aluminum powder
HEALTH HAZARDS Corrosive/Irritating materials	Skin, esp eye, effects Also lung effects	Sulfuric acid, other acids – esp hydrofluoric Caustic soda, other alkalis Ammonia, chlorine
Particles	Lung effects	Asbestos fibres Silicadust Wood dust Iron dust

B - Hazards associated with materials and substances (continued)

Category	Type of Harm	Examples of Hazards
Vapors	Acute and chronic effects on health	Benzene Toluene Acetone Some solvents
Fumes	Acute and chronic effects on health (local and systemic effects)	Lead fume Rubber fume Asphalt fume
Gases	Acute and chronic effects on health	Carbonmonoxide Hydrogensulfide Sulfurdioxide
Mists	Acute and chronic effects on health	Oil mist, cutting fluids Printing ink mist Detergents Aerosols
Asphyxiants	Acute and chronic effects on health	Nitrogen Carbon dioxide Argon
Health hazard by ingestion	Burns to upper alimentary tract	Toxic, harmful, corrosive and irritant liquids
	Poisoning	All harmful aerosols Polluted water Contaminated food and drink
Hazards by contact	Cuts, abrasions	Swarf Rough timber Concrete blocks
	Burns, Frostbite Also structural failure	Molten metal Frozen food Cryogenic gases

Category	Type of Harm	Examples of Hazards
ENVIRONMENTAL HAZARDS Hazardous waste storage and disposal	Groundwater / Soil pollution	Crude/Condensate & product sea & road transportation and storage Storage of hazardous sludge/material in pits NORM waste (scales, sludge)

C - Hazards associated with the place of work

Category	Type of Harm	Examples of Hazards
Pedestrian Access	Tripping, slipping	Damaged floors Trailing cables Oil, grease spills Water on floors Debris Wet grass Sloping surface Uneven steps Changes in floor levels
Pedestrian Access	Vehicle collision	Poorly defined or un-segregated access routes – car parks, loading areas, docks, warehouses, etc.
Work at heights	Falls	Fragile roof Edge of roof Work on ladder Erecting scaffold Hole in floor
Obstructions	Striking against	Low headroom Sharp projections

Category	Type of Harm	Examples of Hazards
Stacking/Storing	Falling materials	High stacks Insecure stacks Inadequate or overloaded racking Stacking at heights Damaged racking
Work over/near liquids, dusts, etc.	Fall into a substances, drowning, poisoning, suffocation, etc.	Tank Reservoir Sump Sewer Work over water
Emergencies	Trapping in fire	Locked exits Obstructed egress Long exit route Lone working at height (crane, tower, etc.)

D - Hazards associated with methods of work

Category	Type of Harm	Example of Hazard
Manual handling	Back injury, hernia, etc.	Lifting Lowering Twisting Carrying Pushing Pulling Hot / Cold loads Rough loads Live loads – persons
Repetitive movements	Work related upper limb disorders	Keyboard work Using screwdriver Using hammer and chisel Bricklaying
Posture	Work related upper	Seated work

	limb disorders, stress, etc.	Work above head height Work at floor level

E - Hazards associated with the working environment

Category	Type of Harm	Example of Hazard
Light (NB: Also increases risk of contact other hazards)	Eye strain, arc eye and cataracts	Glare, reflections Poor lighting Stroboscopic effect Arc welding Molten metal
Temperature	Heat stress, hypothermia	Work in near/above furnace or oven Cold room
	Heat stress, sunburn, melanoma, hypothermia, etc.	Outdoor work Hot weather Cold weather Wind chill factor Work in rain, snow, etc.
Confined spaces	Asphyxiation, explosion, poisoning, claustrophobia, etc.	Work in tank Chimney stack Pit, sewer, Basement ,Unventilated room Vessel ,Excavation
Ventilation	“Sick Building Syndrome”, nausea, tiredness, etc.	Fumes, Odors , Tobacco smoke

F - Hazards associated with work organization

Category	Type of Harm	Example of Hazard
All workers	Injuries and ill health to employees by contractors	Work above or near others Use of harmful substances Welding
	Injuries and ill health to contractors'by employees	Process fumes Services (e.g. underground electricity cables) Stored hazardous materials
Organization of work	Injuries to employees	Monotonous work Stress Too much work Lack of control of job Work too demanding
Work in public area	Injuries and ill health of public	Trailing cables Traffic/ Plant / Rig /Ship movement Road transport Work above public Drilling, storage, prodcution near dwelling area

Appendix E: Hazard Effect

HAZARD EFFECT	HAZARD EFFECT RATING	PEOPLE	Property Damage	ENVIRONMENT
	VERY HIGH	MULTIPLE FATALITIES	MAJOR LOSS GREATER THAN $10 MILLION	TOTAL LOSS OF CONTAINMENT
	HIGH	FATAL INJURY PERMANENT DISABILITY	SIGNIFICANT DAMAGE LOSS $01 MILLION	OIL SPILL EXCEEDING 100 BBL
	MEDIUM	LOST TIME HOSPITALIZATION TEMPORARY DISABILITY	MODERATE DAMAGE LOSS $100K	SPILL 10 BBL
	LOW	NO LOST TIME NO HOSPITALIZATION FIRST AID	$50K	SPILL 05 BBL
	VERY LOW	SIMPLE FIRST AID	LOSS $05K	SPILL 0.5 BBL

Appendix F: Probability table

Rating	Probability (P)
H	Event* likely to occur more than once per quarter
M	Event* likely to occur at least once in six months
L	Event* likely to occur less than once per year

Appendix G: Examples of Control Measures to be applied.

Control Measure	Typical Examples
1. Physical	Removal of fuses; Insert spade or blank flange in pipe work; Lock off valve; Erect mechanical barrier; Use locked enclosure; Keep people at a distance (e.g., signs, warning tape); Eliminate or substitute toxic substances; Substitute noisy machinery; Use mechanical handling equipment.
2. Procedural	Test for pressure build-up or leaks; Examination of flushing fluid; Test for hazardous chemicals in liquid, solid or gaseous form; Procedure for control of simultaneous or adjacent work; Prohibition of hot work; Equipment lock-out; Develop contingency plan,
3. Human	Use of independent specialist personnel; Regular or constant monitoring of the Task; Use of method statements / detailed procedures; Clear instructions and warnings to workforce; Clear definitions of roles and responsibilities during the Task; Adequate supervision; Ensure competency of personnel for the activity

Control Measure	Typical Examples
4. Time	Limit duration of the Task or time of day when the activity occurs; Use time-saving measures such as hot-bolting, good work-site preparation and planning for the movement of materials, tools.
5a. Contingency (Control)	Emergency shutdown, deluge and blow-down systems, reduction of inventory.
5b. Contingency (Mitigation)	Temporary refuge, emergency response system, fire/blast wall, water curtain, provision of PPE, rescue equipment, etc.

Appendix H: Residual Risk Measures further actions

RISK FACTOR	CONTROL ACTIONS
13 – 15	IMMEDIATE ACTION, TASK MUST NOT PROCEED, SERIOUS LOSS POTENTIAL TASK MAY PROCEED ONLY WITH ADDITIONAL CONTROLS IN PLACE TO AVOID SERIOUS LOSS
12 – 9	PLAN CONTROLS TO REDUCE RISK FURTHER. ASSESS PRIORITY AND AGREE IMPLEMENTATION TARGETS WITHIN 07 DAYS
8 – 6	MONITOR PROCEDURES AND CONTROLS TO ENSURE RISK IS MAINTAINED AS LOW AS REASONABLY PRACTICAL. TAKE IMMEDIATE ACTION IF STANDARDS ARE NOT MET. ENSURE ADDITIONAL CONTROLS IMPLEMENTED WITHIN ONE MONTH.
5 – 4	IMPLEMENT CONTROLS TO REDUCE RISK TO LOWEST LEVEL REASONABLY PRACTICABLE WITHIN 03 MONTHS MAXIMUM
3 –2	PREPARE PLAN TO REDUCE RISK TO LOWEST LEVEL REASONABLY PRACTICABLE. ACTION WITHIN ONE-YEAR MAXIMUM.
1	MONITOR TO ENSURE RISK DOES NOT INCREASE

Appendix I: Risk Matrix

HAZARD EFFECT SEVERITY

PROBABILITY	VL	L	M	H	VH
H	5	7	9	13	15

M	3	6	8	12	14
L	1	2	4	10	11

8.2 Environmental Aspects

8.2.1 Purpose.

The purpose of this procedure is to define the methods concerning with:-
- The identification of the environmental aspects of PETROJET activities\ services.
- The identification of the significant environmental aspects of PETROJET activities \ services.
- The evaluation of the significant impacts on the environment.
- Determining controls of the significant impacts on the environment.

8.2.2 Scope.

- The identification and evaluation of the Environmental aspects has to be carried out for all activities or services of all sites. This procedure describes the way to identify such aspects and helps to evaluate impacts on environment.

8.2.3 References.

8.2.3.1: ISO 14001
8.2.3.2: PETROJET HSE Manual.
8.2.3.3: Environmental laws.

8.2.4. Definitions.

Environment:-surroundings in which PETROJET operates, including air, water, land , natural resources, flora, fauna, humans and their interrelation.

Note: - Surroundings in this context extend from within PETROJET the global system.

Environmental Aspects: - Element of a PETROJET'S activities or products or services that can interact with the environment.

Note: - A significant environmental aspect has or can have a significant environmental impact.

Environmental Impact: - any change to the environment, whether adverse or beneficial, wholly or partially resulting from a PETROJET'S environmental aspects.

8.2.5. Procedure and responsibilities.

8.2.5.1 Responsibilities:-

Typically, the Construction manager and HSE department are responsible for all issues concerning the identification of Environmental Aspects and Impacts related to operations. But operations manager and contractors can hold responsibilities in their identification and evaluation, and the rest of the personnel involved in the affiliate activities participate to make

the Aspects/impacts identification and evaluation as efficient as possible.

8.2.5.2 Procedure:-

An environmental aspect assessment will be made or systematically reviewed/updated in case of:

- Process operating modification,
- New project or development,
- Emergency situation,
- New legislation release,
- Progress of knowledge on environmental matters,
- Site restitution,
- Environmental accidents,
- According to retention time.

8.2.5.3. Aspect Identification:-

At first, environmental aspects related to this area's activities, products and services should beidentified within the defined scope of the Environmental Management System. Ongoing and

Planned activities that could cause environmental impacts should be taken into account. Every Environmental Aspect will be registered in the "environmental aspect description" field ofthe form of (Environmental Aspects Identification an |Evaluation Register) while the work causing this aspect will be entered in the corresponding field. An

Aspect must be described in a way showing its potential impacts on the environment.

Example of environmental aspects:

- Emission to air, noise, odor, vibration,
- Effluent discharge, spillage from liquid chemical, releases to water, aqueous discharges,hazardous and non-hazardous wastes,
- Disposal of waste, releases to land,
- Use of raw material and natural resources (e.g. land use, water use),
- Use of energy,
- Planned outputs of product.

8.2.5.4. Impact Identification.

An environmental aspect can have one or more environmental impacts. An impact must bedescribed in a way showing what changes of the environment may eventually occur.So, all the generated/potential impacts for which a relation of cause and effect will be foundbetween them and the identified environmental aspects will be listed and assessed.

9. Lifting Operations

PJ - HSEMSP 4.4.6.9

9.0 Introduction

This document the PETROJET – Lifting Operations Policy (volume 1), outlines the minimum requirements and standards acceptable to PETROJET for the selection and safe use of lifting equipment and accessories utilized in our lifting and cargo handling operations.

Lifting equipment and lifting accessories must comply with the applicable legislation, regulations, national standards and PETROJET's standards which, in some cases, may be more stringent.

Lifting practices will generally be aligned with the guidance given in the NSL "International Rigging and Lifting Handbook".

Cargo handling will generally be aligned with the NSL "Safe Cargo Handling – Good and Bad Practice" pocketbook".

The PETROJET Lifting standard is separated into two (2) Volumes. Volume 1 is the overall standard and Volume 2 are the general guidelines to follow when conducting a lifting operation.

This standard (Volume 1) is divided into 3 parts as follows;

- **Part 1**- Contains general information including the introduction, purpose, scope and a list of activities cross referenced with their relevant controlling procedures.
- **Part 2**- Details PETROJET's Planning and Risk Assessment process for the safe use and operation of lifting equipment. It also addresses personnel's training and competence.
- **Part 3**- Describes PETROJET's Written Scheme of Examination for lifting equipment including qualifications for lifting inspectors

This policy document is supported by the PETROJET Lifting Operations Guidance (volume 2), which contains guidance and proven safe operating procedures.

9.1 Part 1 General Information

9.1.1 Objectives

To summarize the responsibilities of those persons who are involved in the supply, operation and control of lifting equipment as used onshore and offshore in PETROJET's lifting and cargo handling operations. In addition, it is to ensure that a uniform approach is adopted with regards to the supply and safe use of lifting equipment and accessories and specifically:

1- To increase safety in lifting operations.

2- To provide for safe and efficient movement of cargo and equipment.

3- To prevent accidents, injuries and damage to equipment.
4- To ensure compliance with relevant legislation.
5- To ensure the supply of suitable equipment.
6- To ensure all lifting equipment and accessories are fully identified, traceable and marked accordingly.
7- To ensure that lifting equipment / accessories are held in a secure location and that their movements are controlled.
8- To ensure continuing integrity of lifting equipment by appropriate maintenance and inspection programmes.
9- To ensure that lifting equipment / accessories are examined prior to and after use.
10- To inform personnel of their obligations to perform lifting operations safely.
11- To ensure that all lifts are risk assessed, planned and implemented with the required levels of competence and organization.
12- To identify deficiencies and ensure that corrective measures are enacted.
13- To ensure that accurate and meaningful records are maintained.

Safety is a fundamental line management responsibility. Effective use of this policy will ensure that lifting operations onshore and offshore, and transportation activities are performed according to accepted procedures, rules and standards.

9.1.2 Scope

This policy covers all installations, facilities, and employees of PETROJET including employees of any operator, contractor or outside agency that work at any facilities owned, operated and / or managed by PETROJET or 3rd party facilities or installations supporting the PETROJET operations.

The scope of this policy includes, but may not be limited to fixed and portable lifting equipment and accessories identified in the 'Written Scheme of Examination'.

This policy and accompanying procedures / guidance in volume 2 will establish:

(1) The minimum standard for the control of safe lifting operations at PETROJET's worksites
(2) The minimum standard for the handling and transport of cargo in support of PETROJET's operations
(3) The minimum inspection and certification requirements for all lifting appliances and accessories
(4) Provide material specifications for loose lifting gear
(5) Auditing requirements
(6) Training requirements

Contractor companies may operate to their own standards but only if it can be demonstrated that they are equal to or exceed PETROJET's minimum operating standards.

9.1.3 Activities / Controlling Procedures

PETROJET'S Lifting Operations policy is described in this document, which addresses the planning and risk assessment of lifting operations, personnel competence and the written scheme of examination.

The activities related to the safe use of fixed lifting, and specialized portable lifting equipment, are controlled by Volume 2 – Lifting Operations Guidance as follows:

- **Correct selection of appropriate lifting equipment and accessories:** PETROJET's volume 2 – Lifting Operations Guidance – Part 2.0
- **Purchase of new lifting equipment and accessories:** PETROJET's volume 2 Lifting Operations Guidance - Parts 2.0 and 3.0
- **Quality of rented lifting equipment (rigging lofts etc.):** PETROJET's volume 2 Lifting Operations Guidance – Part 4.0
- **Quality of sub-contractor's lifting equipment:** PETROJET's volume 2 Lifting Operations Guidance – Part 4.0
- **Quality of contracted–in lifting equipment (i.e. cranes and forklift trucks):** PETROJET's volume 2 Lifting Operations Guidance – Part 4.0
- **Repair / overhaul of lifting equipment and accessories:** PETROJET's volume 2 Lifting Operations Guidance – Part 5.0
- **Statutory examinations of lifting equipment and accessories:** PETROJET's volume 2 Lifting Operations Guidance – Part 5.0
- **Maintenance of fixed lifting equipment:** PETROJET's volume 2 Lifting Operations Guidance – Part 5.0

Additional documents covering the safe use of lifting equipment and accessories: The International Rigging and Lifting Handbook, and Safe Cargo Handling – Good and Bad Practice Pocketbook

9.2 Part 2 Planning, Risk Assessment and Competence in Lifting Operations

9.2.1Introduction

Safety in lifting and cargo handling operations is largely dependent on the competence of the personnel involved. At present, personnel from all trades use lifting equipment and accessories to perform tasks of varying complexity. For that reason, it is vitally important to establish that their level of training and / or experience is adequate for them to perform the work safely and efficiently. Safety can be further increased by planning the lifts properly and performing risk assessments.

Lifting / cargo handling operations vary from simple or routine to complex and the depth of planning and risk assessment should reflect this.

Whether the job is routine or complex, the proper level of planning will also identify possible problems in advance and so allow for additional measures to be taken to eliminate the problems. Where toolbox talks are normally adequate for the planning of routine / simple lifts, PETROJET's "Lifting Operation Plan" must be used for complicated and complex lifts.

To enhance safety in lifting operations on PETROJET's installations or worksites, this document gives guidance on personnel's competence, risk assessment and planning.

9.2.2. Purpose

- To ensure compliance with lifting related legislation / regulations.
- To inform personnel of their obligations to perform lifting / cargo handling operations safely.
- Promote the use of risk assessments.
- To underline the importance of proper planning.
- To explain the need for levels of competence.

9.2.3 Scope

Includes all personnel (staff and contractors) involved in lifting / cargo handling activities on PETROJET's Installations or worksites.

9.2.4 Planning

In lifting / cargo handling operations, practically each and every job is different and for safety reasons, they all have to be planned. The depth of the planning will increase with the complexity of the job and there are numerous factors to consider e.g.:

(1) The weight of the load.
(2) Position / height of the centre of gravity.
(3) Stability of the load.
(4) Size and shape of the load.
(5) Protection of load during lift.
(6) Availability of dedicated lifting points on the load.
(7) Availability of suitable rigging.
(8) Protection of rigging against sharp edges.
(9) Capacity of the crane / hoisting equipment.
(10) Availability of certified anchor points / support steelwork.
(11) Available headroom
(12) Route to be traveled
(13) Obstructions
(14) Maximum height the load has to be lifted
(15) Any dynamic factors
(16) Hazards to other personnel
(17) Number of Banksmen required
(18) Communications
(19) Deck / floor capacity for landing the load
(20) The need for tag lines
(21) Available light
(22) Experience / competence of personnel

It is the step-by-step process in the lifting operation plan that must be risk assessed. The actual risk assessment can be performed by anyone who has been trained and / or has experience in using the lifting equipment and accessories in question. However, it is preferable they have

knowledge of or be familiar with the specific lifting operation i.e. whoever has the "local knowledge / expertise".

Risk assessments may also require input from various other personnel / departments to overcome any interface problems. To assist with the planning and assessments, rigging and lifting operations have been divided into four categories as follows:

(1) **Routine lifts** – Lifts that are performed on a regular basis, which involve basic slinging practices e.g. the handling of drill pipe, casing, containers etc usually performed by the deck crew.

a. **Minimum qualification:** These lifts can be performed under supervision by personnel who have attended a Banksman / Slinger course and/or been involved in such operations for 6 months.

b. **Reference material:** The Safe Cargo Handling – Good and bad Practice Pocketbook or the International Rigging and Lifting Handbook.

c. **Planning:** The use of generic written lifting plans and/or toolbox talks is usually adequate for this level of lifting operation.

(2) **Simple lifts** – Lifts that involve the use of basic hoisting equipment e.g. a crane or manual hoist (suspended from dedicated lifting structures such as pad eyes or runway beams) directly above the load. The load would also require have, certifying lifting points or being relatively easy to sling.

a. **Minimum qualification:** These lifts can be performed by personnel who have passed assessment on the company's internal Rigging and Lifting course – (Technician level) and/or been involved in such operations for 12 months. Their competence should be verified by qualified skills assessors.

b. **Reference material:** The International Rigging and Lifting Handbook.

c. **Planning:** The use of generic written lifting plans and/or toolbox talks is usually adequate for this level of lifting operation.

Complicated lifts – Lifts that are difficult due to the nature of the load e.g. awkward shape, offset or high centre of gravity, fragile, containing liquids, no lifting attachments/difficult to sling etc. The actual lifting operation/handling of the lift may also be difficult e.g. it may require to be rotated or cross-hauled involving two or more sets of rigging and / or tandem lifting with cranes.

d. **Minimum qualification**: This type of lift must be performed by qualified Riggers who have either attended an approved Rigging and Lifting training course and / or been involved in such rigging operations for 5 years minimum. In either case, their competence should be verified by qualified skills assessors against the competence criteria for Level 2 Rigging (or equivalent).

e. **Reference material:** The International Rigging and Lifting Handbook plus additional equipment lists, drawings/sketches as required.

f. **Planning:** A written specific lifting plan combined with toolbox talks is required for this level of lifting operation.

(3) **Complex lifts** – These lifts could be any of the first three categories but with additional hazards e.g. extremely heavy loads, confined spaces, restricted headroom, lifting over

unprotected plant or equipment, lifting sub-sea, lifts involving divers, lifts involving floating cranes etc. i.e. lifting operations or conditions which would merit additional engineering input.

a. **Minimum qualification:** This type of lift must be performed by qualified riggers but with engineering support as deemed necessary.
b. **Reference material:** The International Rigging and Lifting Handbook plus additional equipment lists, drawings/sketches as required. Possibly a job pack detailing operating procedure, additional safety procedures, rigging details, individual responsibilities, weather parameters etc.
c. **Planning:** A written specific lifting plan / Job pack combined with toolbox talks is required for this level of lifting operation.

For additional guidance in the categorization process, refer to the "Organization of lifting operations Flowchart" (appendix 2 in volume 2).

To assist with the planning of lifting operations there is a single page planning form for routine and simple lifts (appendix 3 in volume 2). For complicated and complex lifts, there is a four page planning form (appendix 4 in volume 2).

9.2.5 Risk Assessment

The majority of day-to-day tasks are routine and relatively simple and the risk can be assessed via the use of a small pocket card which prompts the user to question their own ability to do the job safely.

In summary, the pocket card system (appendix 5 in volume 2) works as follows:

(1) If you can answer "YES" to the six questions on the first side of the card, proceed with the lifting operation
(2) If you answer "NO" to any of the questions, turn over the card and try to answer the additional twelve questions
(3) If you can answer "YES" to the twelve questions on the second side of the card, proceed with the lifting operation
(4) If you answer "NO" to any of the twelve questions, ask your immediate supervisor for assistance
(5) If your immediate supervisor can give you sufficient assistance to enable you to carry out the job safely, proceed with the lifting operation under his guidance
(6) If your immediate supervisor cannot help or advise you, the full assessment will have to be performed. The four-page questionnaire at the back of the International Rigging and Lifting Handbook can be used to gather the relevant technical information required but the actual written assessment must be recorded via PETROJET's PTW system

As part of the risk assessment, consideration must also be given to the hazards of working at a height where there is a risk of falling etc

For the more complex lifting / cargo handling operation, there is a standard Risk Assessment Form (see appendix 6 in volume 2). Both of these documents are contained in the "International Rigging and Lifting Handbook.

9.2.6 Training and Competence

In Egypt, there are presently no definitive standards of competence for personnel engaged in lifting operations, therefore Internationally recognized standards may be applied e.g. Engineering Contractors Industry Training Board - ECITB or North Sea Lifting Standards – NSL.

The criteria to be met are very much in line with the types of lifting operations encountered in the Oil and Gas and Construction industries. Personnel can be trained in line with and assessed against these standards by approved skills assessors to give a fairly accurate judgment of their ability to perform the work in a safe manner.

The risk assessment process will help to identify personnel who will require additional training and / or skills assessments for their area of responsibility.

Note: All PETROJET staff and dedicated core contract staff who are engaged in lifting and cargo handling operations shall have their competence validated via the PETROJET Competence assurance system. In general terms, the demonstration of competence will include, where appropriate, the completion of suitable training together with referenced workplace experience.

Contractors and suppliers of specialist personnel are responsible for the training of their own staff/workforce and must be able to demonstrate their competence as and when required by PETROJET. PETROJET's requirements for skill/competence levels in the various trades are as follows:

Riggers:

Riggers should be trained to NSL / EAL Rigging and Lifting - Level 2 or similar and / or have a minimum of 5 years experience of lifting operations. This training is aimed at Riggers who have to perform complicated and complex lifting operations. It is also aimed at those responsible for the planning and safe execution of the operations.

Banks men / Signallers / Slingers / Load Handlers:

These personnel should be trained and assessed to NSL / EAL Rigging and Lifting - level 1 or similar and / or have a minimum of 12 months experience of lifting operations. This level of qualification is also applicable to technicians and similar disciplines e.g. various trades who may have to perform routine and simple lifting tasks during the execution of their normal duties. These routine and simple lifting tasks, performed by a Rigger level 1, will be under the supervision of Rigger level 2.

Crane Operators:

Offshore Crane Operators should be trained to Sparrows / OPITO-approved Level 3 (based on Stage 3 / 4 of DOE Guidance Note 5 and BS 7121 part 11).

Onshore Crane Operators should be trained in accordance with HSE Guidance Note G39 and BS 7121 part 3.

Forklift Truck Operators:

Trained to a recognized Egyptian or International equivalent standard.

It is recommended that qualified skills assessors who have relevant practical experience in the same discipline, assess competence levels. It is also recommended that personnel are reassessed at intervals no greater than 2 years to ensure competence is being maintained.

9.3 Part 3 Written Scheme of Examination

9.3.1 Introduction

This Written Scheme of Examination (WSE) has been compiled to identify and describe the examination, inspection and testing activities required to comply with Internationally recognized Lifting Operations & Lifting Equipment Regulations.

9.3.2 Purpose

The purpose of the Written Scheme of Examination is to ensure that all lifting equipment is properly maintained, examined, certified, and controlled in a manner, which will improve safety in lifting operations by:

- Ensuring that only certified equipment is made available for use
- Highlighting when equipment is in need of repair
- Identifying and removing defective equipment from circulation
- The keeping of accurate records

9.3.3 Scope

The scope of the written scheme extends to all lifting operations and lifting equipment in use on PETROJET's installations or worksites.

The objectives are to:

- Identify and define 'Lifting equipment'.
- Detail the frequency of the examinations to be carried out
- Identify the roles and responsibilities of personnel
- Identify who will be carrying out examinations
- Define minimum standards of competence for those carrying out the examinations

9.3.4 Frequency of Examinations

Due to the harsh environment in Egypt, it is PETROJET's policy that at onshore worksites and on offshore installations all lifting equipment and accessories must be examined (and tested where appropriate):

(1) Before it is put into service for the first time.

(2) After installation / assembly at a new site (if the safety of the equipment is dependent on installation conditions)

(3) At specified intervals dependent on operational circumstances as follows:

i) Lifting equipment used for lifting persons – at least every 6 months

ii) Lifting accessories – at least every 6 months

iii) Any other lifting equipment – at least every 12 months

(4) Each time that exceptional circumstances which are liable to jeopardize the safety of the lifting equipment has occurred

(5) Lifting equipment with moving and / or enclosed parts (e.g. chainblocks, pullifts, Tirfors etc.) will remain in the category where they are examined **every 6 months** and / or replaced with newly certified equipment as per the Rigging Loft change-out system

(6) Lifting support steel work with NO moving parts such as runway beams, pad eyes, permanently attached or integral lifting eyes etc. will have their periodicity of examination extended to 12 months as long as:

i) They are not used for supporting personnel

ii) Their use is infrequent to the extent that wear is not an adverse factor

iii) They are adequately coated / protected so that corrosion is not an adverse factor

(7) Support steelwork as described above but seldom used (e.g. less than once a year) will NOT be re-examined on a regular basis but will only be examined by a suitably qualified competent person (e.g. a lifting equipment Inspection Engineer) immediately prior to any usage. The categorizing of the support steelwork will be based on previous experience

(8) Pedestal cranes etc. will continue to be maintained and monitored by the Crane Services Contractor and examined every 12 months by a 3rd party Specialist Company.

(9) Lifting Equipment that is described as 'Drilling specific would normally be maintained by the Drilling Department and examined on a regular basis in accordance with table 1 in section 5.3 of volume 2 - Lifting Operations Guidance.

9.3.5 Organizing of Statutory Examinations

The Lifting Operations AGM, Drilling Supervisor or Site Supervisor are responsible for the organizing of Statutory Examinations on both fixed lifting equipment and drilling lifting equipment on the installation / at the worksite. They will advise all relevant personnel of the impending examinations to allow them to prepare and make available all lifting equipment and accessories. The Lifting Operations AGM, Drilling Supervisor or Site Supervisor will then mobilize the specialist personnel to perform the inspections. The Lifting Operations AGM and Lifting Equipment specialist contractor will help co-ordinate activities by providing administration services for any remedial work required on the lifting equipment/accessories.

They are also responsible for maintenance of all lifting equipment test and examination records. Where equipment has no specified inspection date, then the competent person for lifting operations shall request, prior to use, that a thorough examination is carried out by a suitably qualified person. All thorough examinations shall be documented.

9.3.6 Personnel Conducting Examinations

Generally, statutory examinations on "fixed" equipment will be carried out by third party specialist lifting companies. Their inspectors will either possess the relevant "Lifting Equipment Engineers Association" (LEEA) certificates, NSL / EAL competence certificates or

qualify as competent through in-house training and experience (at least 5 years in the field). If the latter is the case, the Specialist Company must be able to produce training records and / or be able to demonstrate to PETROJET, their competence by other means as and when requested. In certain circumstances, this specialist company may be the manufacturer of complex equipment such as cranes and access machinery.

Accessories or portable lifting equipment (e.g. rigging lofts) are actually changed out every 6 months and the maintenance and examination is carried out by specialist lifting companies as mentioned above.

The quality of the maintenance service is controlled by PETROJET's Onshore Workshop Overhaul Procedures contained in PETROJET's Lifting Operations Guidance, Volume 2.

Notwithstanding the above, pre-use inspection, will be carried out by everyone preparing to use lifting equipment.

9.3.7 Methods of Examination and Examination Procedures

The methods of thorough examination/inspection and testing for the purpose of this written scheme are as follows:

- Visual Inspection
- NDT Inspections
- Load Testing

(1) Visual Inspection

This term is generally referred to as 'Thorough examination'. Close visual inspection requires that the equipment to be used is free from:

a. Any defect that would preclude it from safely handling the test load
b. In the case of load testing and / or the task to be carried out
c. In the correct configuration and condition according to the manufacturers instructions
d. In the case of cranes, suitably rigged for the load under consideration

Where necessary the competent person (lifting equipment examiner) may deem it necessary to the opening up of concealed or encased parts by a skilled person.

(2) NDT Inspections

Where considered necessary the competent person (lifting equipment examiner) may deem that non-destructive testing is carried out, particularly on welded sections or components.

The method to be utilized will be determined by the competent person (QA / QC inspector or metallurgist).

(3) Load Testing

Load Testing is required to prove the lifting equipment's initial integrity for the purpose for which it will be used. The manufacturer would generally carry this out. Primary exceptions to this are cranes, which are load tested at regular intervals. In addition, lifting equipment is required to be load tested following any substantial alteration or repair likely to affect the

strength or stability of the equipment. Any lifting gear to be used with the crane in normal duties or for the purpose of testing the crane should be tested separately from the crane prior to use. After load testing a thorough examination should be carried out by a competent person (lifting equipment examiner) to ensure the equipment has withstood the test loadings without signs of damage that would affect the safe use of the equipment, such as:

- Cracking
- Permanent deformation
- Loosening or damage to structural connections

In the case of cranes all safety switches, e.g. overhoist; bottom limit, derricking limit, etc. should be checked for correct operation.

To guarantee the quality of inspections, the minimum amount of work to be performed during such inspections is specified in the examination procedures contained in volume 2, Lifting Operations Guidance, Part 5.0.

9.3.8 Colour Coding of Equipment

PETROJET operates a 3 part colour code system for newly certified portable lifting equipment that is used in PETROJET's operations. This colour code is changed every 6 months and consequently covers an 18 month cycle. The colours used are: **Blue, Green and Yellow**

Items, which are examined / re-certified on a 6 Monthly basis, will follow the current practice of being colour coded with the relevant period indicator.

Items, which are examined / re-certified on a 6 Monthly basis will be single colour-coded, i.e. with the current colour.

Condemned equipment will be colour coded RED until such times as it can be repaired or removed from the worksite.

Note: By the same token, the worksite's slings should not be used for backloading goods to suppliers, as this will deplete the worksite's stock.

Any build-up of transit slings / shackles etc. at the worksite should be backloaded to the supplier

9.3.9 Condemned Gear – Quarantine Procedure

Any lifting equipment found to be defective during an inspection (or at any time during normal use) must be removed from service immediately until such times as the defect can either be remedied or the item can be removed from the workplace / Installation. Notification of defective equipment must be given to

the relevant Supervisor who will arrange to repair or return the defective equipment to the onshore rigging loft for repair or scrap.

9.3.10 Actioning of defects lists

A Maximo work order is raised to repair defective fixed equipment. Defective portable equipment is put in quarantine and then back-loaded for repair at the onshore rigging loft.

9.3.11 Information Required for Database

Statutory examination report forms and defect lists will normally be supplied by the 3rd party independent lifting equipment Inspection Company or other specialist company. When completed, the reports must contain enough information to fully describe the item, its condition/suitability for further service, any defects and any recommendations.

The defects list must contain the following information:

(1) Location,

(2) ID Number,

(3) Description,

(4) SWL / WLL,

(5) Defect / reason for condemning,

(6) Date and signature of person conducting the examination.

9.3.12 List of Equipment to which this scheme applies

Lifting equipment is divided into two categories referred to as 'Lifting Appliances' and 'Lifting Accessories'. They are defined as follows:

(1) **Lifting Appliances:** This term pertains to appliances or machinery capable of raising, suspending or lowering a load. Included are any attachments used for anchoring, fixing or supporting the appliance.

Sample list of Lifting Appliances:

- Mobile Cranes
- Overhead Gantry Cranes
- Air Hoists
- Electric Hoists
- Hydraulic Hoists
- Manual Chain hoists (chain blocks)
- Wire rope Hoists (Tirfors)
- Lever Hoists (Pullifts)
- Combined Hoists and Trolleys
- Runway Beams

- Welded Pad eyes
- Bolted Pad eyes
- Air Winches
- Hydraulic Winches
- Manual Winches
- Scissor Lifts
- Forklift Truck
- Forklift Truck Lifting Attachments
- Mobile Elevating Work Platform
- Beam Trolleys
- Beam Clamps

(2) **Lifting Accessories:** This term pertains to components for attaching loads(s) to lifting appliances or machinery e.g. slings and shackles etc.

Sample List of 'Lifting Accessories':

- Safety Hooks
- "C" Hooks
- Swivel Hooks
- Pipe Hooks
- Crane Hook Blocks*
- Wire Rope Slings
- Chain Slings
- Webbing Slings
- Wire Rope
- Shackles
- Swivels
- Rigging Screws
- Vertical Plate Clamps
- Horizontal Plate Clamps
- Lifting Beams
- Sheave Blocks
- Inertia Reels and Safety Harnesses
- Collar Eyebolts
- Man-riding Baskets/Passenger Cradles
- Man-riding Belts
- Rope Access Equipment

***** Recommended that these are overhauled and inspected / retested where required every 4 years.

The following drilling specific lifting equipment will be included in the scheme of examination:

- Crown Block
- Top Drive Rotary Connections
- Drawworks

- Travelling blocks and dollies
- Elevator links
- BOP Handling Equipment
- Riser and Conductor Handling Tools
- Tubing Hooks
- Spider Mechanical and Air Powered Slips
- Kelly Bushings
- Casing, Tubing and Drill Pipe Elevators
- Swivel Bail Adapters
- Rotary Slips
- Tongs
- Deadline Tie-Downs (Anchors)
- Kelly Assembly Connections (including Kelly Driver)
- Lifting Caps, Plugs, clamps, hooks and Subs
- Rotary Swivels (including Hoses)
- Kelly Spinners (used as tension member)
- Connectors and Link Adapters
- Power Swivels and Power Subs
- Overhead Drilling Systems (Top Drive System)
- Master Bushings
- Derrick Structure (including Dolly Track)
- Block to Hook Adapters
- Rotary Tables

For further information on Lifting Appliances and Lifting Accessories, refer to the Lifting Equipment Legislation Matrix at appendix 7 in Volume 2.

10.Waste Management

PJ – HSEMSP4.4.6.14

1.1 Purpose.

Defining the operations and operational activities which have Significant Impact on the Environment and/or High Occupational Risk.

1.2 Scope.

Waste Management is one of the operational activities/ aspects which affect the HSE.

1.3 References.

3.1: ISO 14001:2004
3.2: OHSAS 18001:2007
3.3: Law 4/1994 for environment
3.4: Law 12/2003.

1.4 Definitions.

None

1.5 Procedure and Responsibilities

10.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSE and issue the instructions concerning it.

10.5.2 The concernedDepartments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks / Environmental Impact.

10.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

10.5.4 Making sure that the work locations provide the HSE correct conditions and the instructions of starting and finishing operations.

10.5.5 As for operations of obvious Occupational Risk, the employees should be qualified and trained to execute it, according to the operating Work Instruction.

10.5.7 Monitoring andmeasuring operations which affects the HSE, according to the HSE Monitoring and Measurements Procedure.

10.5.8 The HSE Manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSE obligations and other requirements.

1.6 Waste Management

(a) Scope

This Safe Instructions covers the requirements to control the disposal of waste materials generated from the Construction Project, Workshops, Centres and offices.

The Safe Instructions is written to comply with the requirements of the PETROJET HSE Policy which specify that the Company will endeavour to reduce the amount of waste materials generated from its activities.

(b) Definitions

None

(c) Responsibilities

The (Safety Officer) are responsible for ensuring that the requirements of the Safe Instructions are complied with, and that all staff is made aware of the Safe Instructions and their responsibilities to comply with it.

(d) Safe Instructions

i. Objectives of Safe Instructions

The objectives of the waste management program are to:

1. Quantify and record the types and quantities of solid waste generated.
2. Use industry best practice to dispose of solid waste in an environmentally sound way, taking into account the cost and available local resources.
3. Ensure that solid waste is stored and transported in a safe and environmentally responsible manner.

ii. Organization

Waste undergoes several steps before it is finally disposed off, co-ordination between the involved parties is essential for the success of the plan.

Project Sector Manager

Ensure that all solid waste generated is accounted for and disposed of according to this Safe Instructions.

Sector, Department Managers and Section Heads

- Comply with these Safe Instructions requirements.
- Maintain a record of all waste generated.
- Conduct regular compliance audits.

Administration Services Sector Manager

- Ensure that solid waste is stored and transported in a safe and environmentally responsible manner. In co-ordination with the above Line Managers and HSE Manager:
- Ensure that contractors used can deal safely, effectively and legally with waste consignments.
- Ensure that payment is withheld until a completed waste manifest form is returned.

Health Safety and Environment Manager

- Report Annually on the waste generated.
- Act as interface with environmental authorities.

- Ensure compliance with this Safe Instructions through regular audits.
- Ensure awareness of the Safe Instructions requirements amongst company and contractors personnel.

iii. 4.3 Waste Classification

Solid waste generated from the site can be classified as:

- Domestic waste.
- Inert industrial waste.
- Special industrial waste.

iv. Waste Disposal Strategies

Full compliance with Law No. 4:1994 and law NO. 9:1999. Furthermore, (follow) the principle of the 5 Rs subject to local environmental regulations and resources to handle waste.

The 5 Rs:

1. REDUCE - generating less waste in their original form.
2. REUSE - reusing materials in their original form.
3. RECYCLE - converting waste back into a usable material.
4. RECOVER - extracting materials or energy from a waste for other uses.
5. RESIDUE - an unavoidable waste residue, which requires a waste disposal method.

The above methods are usually used in combination by reduction and recycling or recovery and reuse.

Selection of disposal methods was based on the following factors:

- Waste characteristics.
- Physical and chemical properties.
- Concentration of contaminants.
- Likely environmental effects.
- The availability of environmentally and commercially acceptable disposal facilities.
- The types of waste material likely to be generated and the proposed method of disposal are given in the following tables:

Table 1 DOMESTIC WASTE

Type of waste	Source(s)	Disposal method
Paper	Offices	Reduce at the source /Recycling
Cardboard	Offices/Warehouse	Recycling company
Plastic	Water bottles Plastic cups Yoghurt cups	Authorized Recycling company

Food waste	Restaurant	Cooking oil is recuperated, disposed.
Toner cartridges	Laser printers, Copiers	Authorized Recycling company
Sewage	Mess , W.C.	Authorithed Recycling company

Waste Management

Table 2 INERT INDUSTRIAL WASTES

Type of waste	Source(s)	Disposal method
Scrap wood	Construction	Scrap handlers
Scrap metal	Construction	Scrap handlers
Scrap plastic	Construction	Scrap handlers
Electrical cables	Construction	Scrap handlers
Construction and demolition material	Construction	Landfill
Insulation Material	Construction	Authorized Recycling company

Table 3 SPECIAL INDUSTRIAL WASTE

Special industrial waste likely to be generated from certain activities within the project can be sent for recycling, treated at specialized waste treatment sites.

Type of waste	Source	Disposal method
Filters elements with entrapped liquids (hydrocarbons)	Machinery	Authorized Specialised waste treatment company
Filters - oil	Machinery	Authorized Specialised* waste treatment company
Sludge - tank, vessel, and sump bottoms	Project activities	Authorized Specialised waste treatment company
Paint/ Chemical containers		
Aerosols/Pressurized containers (MPI/D.P.)		
Contaminated soil		
Authorized sub-contractor	Project activities	Authorized sub-contractor
Batteries, dry cell	Project activities	Authorized sub-contractor

(*)Note: Used oil should be sent for recycling.

Table 4 COLOR CODE FOR WASTE CONTAINERS

Type of waste	Base Colour	ID. Colour	Label Colour Arabic, English
Paper, Food waste, plastic	White	Green	White
Scrap metal, wood	White	Blue	White
Batteries, Aerosols, Chemical containers, Toner cartridges	White	Red	White
Electrical cables	White	Black	White
Plastic waste	Blue	White	Blue
Maintenance waste	Blue		
Oily Rugs *	Black*	White*	Black*
Used Fluorescent Lamps *	Yellow *	White*	Yellow*
Medical Waste*	White*		

v. Segregation and Temporary storage of waste

It is of prime importance that waste must be segregated at the source of generation. Therefore, dedicated and clearly marked containers must be made available for temporary storage of different types of waste as indicated in the above tables. Also, it is not always possible to quickly dispose of waste due to logistics constraints and minimum quantity requirements. It is therefore necessary to store waste on the site prior to disposal. Waste should be segregated and stored, adhering to the following guidelines:

- Waste should be stored so that is does not pose any threat to personnel, e.g. no obstructions, correct stacking, away from heat sources.
- Waste should be segregated to facilitate its handling and prevent contamination or chemical reactions.
- When waste has the potential to contaminate the soil, it should be stored in abounded area (Secondary containment).
- Waste materials should be segregated. (A dedicated container for paper, Spray Cans, contaminated paint cans, and another for lead-acid batteries, etc. Other areas are allocated for scrap metals and wood.)

vi. Transportation and treatment of waste

The transportation and treatment of waste are regulated by national laws. Although PETROJET may use contractors to transport its waste, it remains ultimately liable for any harm caused by its waste. It is therefore essential that all contractors selected to handle waste are chosen carefully. As a minimum, the following guidelines should be used:

- Contractors should be approved by National Environmental Protection Agency for the transportation/treatment of waste.
- The Contracts/Procurement Department should withhold payment until a completed waste manifest form is returned.

vii. Record keeping

Records relating to solid waste management, including those relating to contractors will be maintained. Contractors may be used for the transport and disposal of waste arising from the project activities. It is essential, through the process of pre-qualification and bid evaluation that contractors used, can deal safely, effectively and legally with waste consignments, and that the consignments handled by contractors reach the specified disposal site, and are disposed of in the agreed manner. The chosen Contractors (shall provide an authorized document) that he implement of the specified waste transport and disposal requirements according to local law.

Records of shipment of solid waste will include the following information:

- Date of dispatch
- Origin of waste
- Description
- Quantity.
- Container type
- Designated disposal site and method
- Means of transportation
- Confirmation of actual disposal

The information for shipping waste materials will be recorded on a waste manifest form (see Appendix 1) which will accompany each waste consignment, enabling it to be traced from its point of origin to final disposal. The PETROJET Management will ensure that all solid waste is handled in accordance with this plan. The HSE Manager will act as interface with relevant Local and National Authorities.

viii. Employee Involvement

It is within the PETROJET HSE policy to "Involve and consult employees and, where appropriate, their representatives." Specifically PETROJET will:

- Encourage employees to suggest ways of improving the management of solid waste through the safety awareness program and HSE Meetings/Committees.
- Train employees on the implementation of this Safe Instructions.

(e) References

- Law No. 4 for the year 1994 (Egypt)

11. Working at Heights

PJ – HSEMSP4.4.6.5

11.1 INTRODUCTION

11.1.1 Working at heights of 2 meters (6 feet) or higher above the ground cannot proceed unless:

11.1.1.1 Working from a fixed platform with guard or hand rails that were verified by a v competent person.

11.1.1.2 Wearing fall arrest equipment with proper anchor mount, full body harness with double latch self locking snap, use of synthetic fiber lanyards, and shock absorber.

11.1.1.3 Fall arrest equipment will limit free fall to 2 meters or less

11.1.1.4 A visual inspection of the fall arrest equipment and system is completed and any equipment that is damaged or has been activated is taken out of service

11.1.1.5 Persons are competent to perform the work.

11.1.2 This safety practice is designed to provide guidance when working at heights while using fall arresting equipment, scaffolding, man lifts, man baskets and ladders.

11.2 Scope

11.2.1 This practice covers all Petrojet activities while working at height of 2 meters (6 feet) or higher above ground level

11.2.2 The practice will cover the following:

11.2.2.1 Fall arresting equipment

11.2.2.2 Scaffolding

11.2.2.3 Ladders

11.2.2.4 Electric Elevators/Man-lifts

11.3 Fall Arresting Equipment

11.3.1 Requirement to Use Fall Arrest Equipment

11.3.1.1 When an individual is exposed to a fall of more than 2 meters from a workplace because it has not been possible to provide certified scaffolding or a platform with suitable edge protection, that individual must use fall arrest equipment

11.3.2 Fall Arrest Equipment Specification

11.3.2.1 Fall arrest equipment requires a full body harness incorporating buttock straps. Waist belts and chest harnesses are not acceptable except for restricting a person to a working position away from an edge where the risk of falling exists

11.3.2.2 The harness should have a synthetic fiber lanyard attached to it which incorporates a shock absorbing device. The connecting hooks on the ends of the lanyard should be of the auto-locking or double action type. The lanyard and hooks should not exceed 2 meters in length.

11.3.2.3 The entire harness and lanyard assembly should be capable of supporting a static load of at least 140Kg.

11.3.2.4 Where a convenient anchorage point is not available within reach of the lanyard, an additional line may be added to the lanyard. This must be of similar strength to the lanyard and fitted with similar types of hook.

11.3.2.5 Under no circumstances should persons using such lines work in positions where they might fall more than 2 meters before their fall is arrested.

11.3.3 Fall Arrest Equipment Usage

11.3.3.1 Ideally, the lanyard will be secured overhead to a stable structure. The anchorage point should be capable of supporting the shock loading should the harness wearer fall the maximum distance allowed by the lanyard. Where there is a risk of collapse of the workplace e.g. scaffolding, the lanyard should be connected to an entirely independent structure.

11.3.3.2 Double Lanyards should be used and protected from cutting and pinching. In particular, they should be protected where they must pass over sharp edges

11.3.3.3 Hot work and use of chemicals may result in damage to fall arrest equipment which must therefore be kept clear of such work.

11.3.4 Inspection and Maintenance

11.3.4.1 Fall arrest equipment should be kept clean by washing in soap and water as required. It should be allowed to dry naturally without excessive heat

11.3.4.2 All such equipment must be stored in a clean dry place, away from heat and away from abrasive and cutting materials.

11.3.4.3 The equipment should periodically be inspected by a competent person. However, it should be visually inspected every time it is used. If found to be damaged in any way it should be immediately cut up and scrapped so that it cannot be used again

11.3.4.4 Any fall arrest equipment which is subjected to in service loading due to a fall (as distinct to static load testing) must be removed from service and destroyed to prevent it being use again.

11.4 Scaffolding

11.4.1 The common types of scaffolds being used in PetroJet are:
11.4.1.1 Traditional tube and fitting scaffolds.
11.4.1.2 Offshore over side scaffolds.
11.4.1.3 Scaffold platform on mobile crane for onshore and offshore.

11.4.2 Scaffolding requirements used within PetroJet will meet:

11.4.2.1 Egyptian Law - Decree 211, 2003 Chapter 2 Article 15 and 16; and either

11.4.2.2 British StandardEN 12811-1:2003,

11.4.2.3 OSHA 1926 subpart L, or

11.4.2.4 Equivalent standard acceptable by PetroJet HSE.

11.4.2.5 The following requirements are in accordance with the laws and regulations above and are not a complete listing of the specific scaffolding criteria. The

requirement within this Practice provides an overview and specific PetroJet requirements beyond the regulations listed above.

11.4.2.6 Scaffolding companies must provide documentation explaining which scaffolding requirements being implemented and to include all requirements within this practice.

11.4.3 Responsibilities

11.4.3.1 Requestor

11.4.3.1.1 Formally notify the scaffolding foreman of access requirements

11.4.3.1.2 Accurately define the scope of the access requirements to assist the scaffolding contractor ensuring the structure is fit for purpose on erection

11.4.3.1.3 Ensure reasonable timescale are provided to allow sufficient pre task planning and risk assessment to be carried out by scaffold foreman.

11.4.3.2 Scaffolding Foreman

11.4.3.2.1 Arrange permit to work compliance at all times

11.4.3.2.2 Co-ordinate the completion of the task risk assessment and toolbox talks

11.4.3.2.3 Ensure that any potential of activity conflicts are addressed during a pre job planning meeting

11.4.3.2.4 Ensure that sufficient materials are readily available to complete work scope

11.4.3.2.5 Allocate personnel to the task ensuring competencies and number are sufficient to complete tasks safely

11.4.3.2.6 Handover completed scaffold to requestor /end user

11.4.3.2.7 Competent person available to revalidate SCAFFTAG at every 7 days interval

11.4.3.3 User

11.4.3.3.1 Conduct a task risk assessment (TRA) for the activities to be carried out on scaffolding

11.4.3.3.2 identify and manage any conflicting activities that occur when using scaffolding

11.4.3.3.3 Ensure scaffold fit for purpose and any alteration to the structure should be requested to the scaffold foreman

11.4.3.3.4 Notify the scaffolding foreman of any changes to scaffold due to weather, damage or collision

11.4.3.3.5 Maintain a high level of housekeeping whilst working and when leaving the worksite

11.4.3.3.6 Formally notify the scaffold coordinator when work on scaffold has ceased

11.4.3.4 AA and PA

11.4.3.4.1 Completes the appropriate COW prior to erecting and dismantling scaffolding.

11.4.3.4.2 Inspect the scaffolding and worksite daily

11.4.4 Scaffolder's Qualifications

11.4.4.1 PetroJet and/or the contractor are responsible for providing technical and practical training required for the foreman and scaffolder. It is essential that only

qualified, competent and experienced scaffolders are employed to erect, maintain, modify and dismantle scaffolds.

11.4.4.2 Contractor should ensure that all scaffold erectors have a certificate of competency issued by a local Construction Industrial Training Board (CITB) or an in house training programme conducted by a qualified instructor.

11.4.4.3 A training to be in accordance with the UK standard or equivalent and administered through a PetroJet approved instructor.

11.4.4.4 PetroJet and/or the scaffold contractor shall ensure that suitable facilities are provided to provide classroom and "'on the job training ' for potential scaffolders.

11.4.4.5 Scaffolders will be qualified according to their training and experience.

11.4.4.6 The minimum Scaffolders qualifications are listed in table 1.

11.4.5 Scaffold Materials specifications

11.4.5.1 Refer to Table 2 for traditional materials for tube and fitting scaffolds.

11.4.5.2 Light alloy (usually aluminium) is a very soft material and can corrode when in contact with steel.

11.4.5.3 For this reason the following restrictions apply to the use of light alloy scaffolding, access towers and ladders in PetroJet:

4.1.1.1 In onshore the use of light alloy scaffolding, access towers and ladders is not permitted in a non hydrocarbon free environment, other than where a permit has been authorized for the specific activity.

4.1.1.2 In offshore the use of light alloy scaffolding, access towers and ladders is not permitted.

11.4.6 Scaffold Design

11.4.6.1 Working scaffolds listed in the following Table #3 shall be designed by contractor in accordance with appropriate British Standards.

11.4.6.2 The following scaffold types are to be subject to specific design by contractor to the standards of BS or equivalent and with PetroJet approval:

11.4.6.2.1 Offshore over side scaffolds
11.4.6.2.2 Access scaffolds above 30m in height
11.4.6.2.3 Hanging or slung scaffolds
11.4.6.2.4 External free standing scaffolds
11.4.6.2.5 Scaffold required to withstand wind speed > 39 m/s
11.4.6.2.6 Loading platforms over 2.5 KN/M2
11.4.6.2.7 Lifting gantries

11.4.6.3 In all cases where the scaffold doesn't fall within the general criteria of table (3), the contractor shall produce work specifications together with the necessary drawings for all scaffold work, for use by the foreman scaffolder.

11.4.7 General Requirements

11.4.7.1 Only competent persons shall supervise the erection, modification and dismantling of scaffolding

11.4.7.2 All scaffolding will be erected, modified and dismantled under the Control of Work practice and will be erected only for the duration of the work.

11.4.7.3 Scaffolding will be inspected daily by a competent person prior to each use.

11.4.7.4 All scaffolding will have the SCAFFTAG displayed by the access ladder.

11.4.7.5 No scaffolding will be erected in such a manner that restricts emergency equipment or emergency egress routes.

11.4.7.6 Scaffolding footing shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement. Unstable objects shall not be used to support scaffolds or platform units.

11.4.7.7 Scaffold platforms over 2 meters in height or with potential for a person to fall more than 2 meters will have the following:

11.4.7.7.1 Top rail between 0.97 meters and 1.2 meters in height and

11.4.7.7.2 Mid-rail installed at a height approximately midway between the top edge of the guardrail system and the platform surface

11.4.7.7.3 Railing to withstand a force of 200 lbs (890N) in a downward or horizontal direction.

11.4.7.7.4 Toe boards (3.5 inch or 9 cm in height) installed to prevent materials from falling from the platform

11.4.7.7.5 rated plank boards in good condition

11.4.7.7.6 Planks to be same length and thickness without twist or sever cracks.

11.4.7.7.7 secured to structures ever 6 meters vertically and 9 meters horizontally

11.4.7.7.8 Scaffold boards laid without gaps or overlaps that may cause tripping or fall hazards.

11.4.7.7.9 Erected where vertical posts are place at a maximum of 2 meters long the length and between 0.5 meters and 2 meters across the width.

11.4.7.8 Fall arrest system to be used while erecting and dismantling scaffolding and when working within the scaffolding guardrails at heights exceeding 3.1 meters (10 feet) or when there is a potential for falling into the sea.

11.4.7.9 A competent engineer shall design scaffolding over 15 meters in height

11.4.7.10 All access ladders will be secure at the top and have either a rest break provided every 9 meters or be fitted with safety hoops.

11.4.7.11 Access ladders will extend at least 1 meter above the landing platform.

11.4.7.12 Access ladders/walkways will be provided to all platforms and personnel will not climb the scaffold to access any platform

11.4.7.13 During use, scaffolding shall be kept clear of all debris and non-essential material and personnel.

11.4.8 Weather Conditions

11.4.8.1 The scaffolding activities are limited to a maximum of **35 knots.** For scaffold work in excess of 35 knots will require a review of the work location,

prepare a specific Task 2 risk assessment, assessed by safety supervisor, scaffold supervisor, PA and AA to resume scaffold erection.

11.4.9 Over-Side Scaffold Erection (Offshore)

11.4.9.1 Requires valid permit to work available for the task in hand

11.4.9.2 Specific TRA to be conducted for each individual over side job

11.4.9.3 Stand-by vessel is available at all times

11.4.9.4 Radio contact is maintained at all times with the stand-by vessel

11.4.9.5 Fall arrest system is in place including training to the scaffolding operatives, rescue arrangements to be detailed at the rescue plan

11.4.9.6 Life jackets are worn all times

11.4.9.7 Any over side scaffold that is out with the parameters of BS 5973 and/or company technical manuals, is designed by a competent design engineer

11.4.9.8 Weather restrictions are advised by the stand-by vessel captain

11.4.9.9 Over side working during the hours of darkness will only be undertaken in ***EXTREME*** emergency cases and with specific risk assessment. This will require the approval of the concerned department GM, HSE GM and Deputy District GM.

11.4.9.10 Recommended min. man power for over side scaffolding works:

11.4.9.10.1 Two competent scaffolders over-side

11.4.9.10.2 One competent scaffolder providing materials

11.4.9.10.3 One competent radio operator

11.4.10 Materials Storage

11.4.10.1 Once the scaffold is dismantled, all scaffold equipment should be inspected.

11.4.10.2 Boards shall have square or chamfered corners, fitted with galvanized end bands, and fire retardant, to fit offshore operations.

11.4.10.3 The boards are to be free from oil, grease, paints and solvents etc. and from sign of excessive pressure, notches and splits

11.4.10.4 Tubes shall be free from excessive corrosion, excessive bends, and thin, rough or split ends and not be oval in shape.

11.4.10.5 Fittings shall be free from excessive corrosion distortion and have all T bolts present.

11.4.10.6 Ladders shall be free from oil, grease, paints and solvents etc.; distortion, cracks or splits.

11.4.10.7 Any equipment which conforms to the above shall be placed in the relevant racks.

11.4.10.8 Any equipment which doesn't conform to the above and can be repaired and placed back in service.

11.4.10.9 Equipment which is beyond repair or defective for any reason will be quarantined for disposal.

11.5 SCAFFTAG System

11.5.1 All scaffolding will be inspected prior to use and the erectors of the scaffolding and final inspector will use the ScaffTag system.

11.5.2 After completion and final inspection of the scaffold the scaffold will be handed over using the SCAFFTAG system.

11.5.2.1 A SCAFFTAG holder is fitted over a scaffold tube and which displays "DO NOT USE" when empty.

11.5.2.2 A green SCAFFTAG will be inserted in the holder to permit the use of the scaffold.

11.5.2.3 The only person authorised to fix, change or remove SCAFFTAG is a scaffold inspector. The sole exception to this rule is where the performing authority are of the opinion that the scaffold structure is not suitable for the intended job, when they shall remove the SCAFFTAG insert to display the (DO NOT USE) tag and request the scaffold contractor to recertify the scaffold.

11.5.2.4 The SCAFFTAG should be posted next to the access ladder of the scaffold.

11.5.2.5 Inspection of scaffolds in regular service shall take place every seven (7) days, or in addition after sever or adverse weather. The SCAFFTAG should be signed and dated after every re-inspection.

11.5.2.6 Modifications to scaffolds shall be undertaken only by PetroJet or PetroJet approved scaffold contractor and the approval of the site AA. A re-inspection process will be necessary if defects or unauthorised modifications are observed; they shall be reported to the worksite AA and PA. The SCAFFTAG shall be removed from its holder exposing the "DO NOT USE" sign

Scaffold Tag – a standard petrojet holder with inserts for clearly showing whether or not a scaffold meets petrojet's requirements. The contractor shall provide scaffold tags to the Scaffold Erector, Scaffold tags are color coded as follows:

Red Scaffold Tag – indicates that the scaffold has not been inspected or is not safe for use (by anyone other than scaffold craftsmen). The red scaffold tag is also a holder into which either green or yellow scaffold tag inserts are to be placed, as applicable. Only authentic. •

Green Scaffold Tag – indicates that the scaffold is complete, has been inspected, and is safe for use at the time of inspection.

Yellow Scaffold Tag – indicates the scaffold has been inspected and may be used only by workers wearing a properly anchored personal fall arrest system, including full body harness and lanyard. A yellow scaffold tag is required whenever all guardrails or planks cannot physically be installed (i.e., due to

interferences) or must be temporarily removed. A yellow scaffold tag does not permit intentional erection of an incomplete scaffold.

11.5.2.7 SCAFFTAG

11.6 Assurance Process

11.6.1 The Contractor's Scaffolding safety systems are to be audited against this PetroJet HSE Working at Height Practice specifically for scaffolding. Audit to cover implementation of the Practice, materials, Supervision, and the competency of scaffold crew and inspectors.

11.6.2 All scaffolding once erected or modified are to be properly inspected and the SCAFFTAG placed by an internationally trained and competent person.

11.6.3 The attached "Scaffold Inspection Report" (appendix 1) can be used as an audit guide.

11.7 Electric Elevator Mobile Scaffold (man-lift)

11.7.1 General Operating Instructions.

11.7.1.1 Do not operate unless:

11.7.1.1.1 You are trained to safely operate the machine.

11.7.1.1.2 You read, understand and obey the manufacturer's instructions and safety rules, operator's manual and machine decals.

11.7.1.1.3 You inspect the entire machine for possible damage and test all machine functions for proper operation.

11.7.2 Tip-over Hazards

11.7.2.1 Do not raise platform unless base is level, all four outriggers are properly installed and leveling jacks firmly contact floor.

11.7.2.2 Do not adjust or remove outriggers while platform is occupied or raised.

11.7.2.3 Do not move machine while the platform is raised.

11.7.2.4 Do not place or attach overhanging loads to any part of this machine.

11.7.2.5 Do not push off or pull toward any object outside the platform.

11.7.2.6 Do not place ladders or scaffolds in platform or against any part of this machine.

11.7.2.7 Do not use machine to lift material or equipment. Machine is intended for personnel access only.

11.7.2.8 Do not raise platform unless machine is on firm, level surface.

11.7.2.9 Do not use machine on a moving or mobile surface or vehicle.

11.7.2.10 Do not raise platform in strong or gusty winds.

11.7.2.11 Do not exceed rated platform load capacity.

11.7.2.12 Do not operate machine near drop-offs, holes, bumps, debris, unstable or slippery surface or other possible hazardous conditions.

11.7.2.13 Do not alter or disable machine components that in any way affect safety and stability.

11.7.2.14 Do not replace items critical to stability with items of different weight or specification.

11.7.2.15 When moving the machine with a forklift or other transport vehicle, platform should be fully lowered, machine should be turned off and no personnel shall remain in platform.

11.7.3 Fall Hazards

11.7.3.1 Do not sit, stand or climb on platform guard rails.

11.7.3.2 Maintain a firm footing on the platform floor at all times.

11.7.3.3 Do not exit platform while raised. If a power failure occurs, have ground personnel activate manual lowering valve.

11.7.3.4 Keep platform floor clear of debris.

11.7.3.5 Lower platform entry mid-rail before operating.

11.7.4 Electrocution Hazards

11.7.4.1 Maintain safe distances from electrical power lines and apparatus in accordance with applicable governmental regulations.

11.7.4.2 Allow for platform movement, electrical line sway or sag and movement due to strong or gusty winds.

11.7.4.3 Do not use machine as a ground for welding.

11.7.4.4 Do not operate AC powered machine or DC battery charger unless using a 3-wire grounded extension cord connected to a grounded AC circuit. Do not alter or disable 3-wire grounded plugs.

11.7.5 Collision Hazards

11.7.5.1 Check work area for overhead obstructions or other possible hazards.
11.7.5.2 Be aware of crushing hazard when grasping the platform guard rail.
11.7.5.3 Do not lower the platform unless the area below is clear of personnel and obstructions.
11.7.5.4 Be careful when transporting on incline.
11.7.5.5 Stay clear of descending platform.

11.7.6 Improper Use Hazards

11.7.6.1 Do not leave machine unattended unless key is removed to secure from unauthorized use.

11.7.7 Damaged Machine Hazards

11.7.7.1 Do not use a damaged or malfunctioning machine.
11.7.7.2 Conduct a thorough pre-operation inspection of machine and test all functions before each work shift. Immediately tag and remove from service a damaged or malfunctioning machine.

11.7.8 Battery and Charger Safety

11.7.8.1 Batteries contain acid. Always wear protective clothing and eyewear when working with batteries.
11.7.8.2 Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.
11.7.8.3 Battery pack must remain in upright position.
11.7.8.4 Batteries emit explosive gas. Keep sparks and flames away from battery.
11.7.8.5 Charge batteries in a well-ventilated area.
11.7.8.6 Do not expose battery or charger to water and/or rain.
11.7.8.7 Before each use, inspect for damage. Replace damaged items before operating.

11.8 Crane or Derrick Suspended Personnel Platforms

11.8.1 Scope

11.8.1.1 This applies to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on the load lines of cranes.

11.8.2 Operational Criteria

11.8.2.1 Maximum intended load is the total load of all employees, tools, materials, and other loads reasonably anticipated to be applied to a personnel platform or personnel platform component at any one time.

11.8.2.2 The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, elevating work platform or scaffold, would be more hazardous, or is not possible because of structural design or worksite conditions.

11.8.2.3 Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform

11.8.2.4 Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load.

11.8.2.5 The required design factor is achieved by taking the current safety factor of 3.5 and applying the 50 per cent derating of the crane capacity.

11.8.2.6 Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position.

11.8.2.7 The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes equipped with outriggers shall have them all fully deployed following manufacturer's specifications when hoisting employees.

11.8.2.8 The total weight of the loaded personnel platform and related rigging shall not exceed 50 percent of the rated capacity for the radius and configuration of the crane or derrick.

11.8.2.9 The use of machines having live booms is prohibited.

11.8.2.10 The load line hoist drum shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering.) Free fall is prohibited.

11.8.3 Personnel Platforms

11.8.3.1 Design criteria.

11.8.3.1.1 The personnel platform and suspension system shall be designed by a qualified engineer or a qualified person competent in structural design.

11.8.3.1.2 The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

11.8.3.1.3 The personnel platform itself, except the guardrail system and personal fall arrest system anchorages, shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

11.8.3.2 Platform specifications.

11.8.3.2.1 Each personnel platform shall be equipped with a guardrail system and be enclosed at least from the toe board to mid-rail with either solid construction or expanded metal having openings no greater than \1/2\ inch (1.27 cm).

11.8.3.2.2 A grab rail shall be installed inside the entire perimeter of the personnel platform.

11.8.3.2.3 Access gates, if installed, shall not swing outward during hoisting.

11.8.3.2.4 Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

11.8.3.2.5 Headroom shall be provided which allows employees to stand upright in the platform.

11.8.3.2.6 In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

11.8.3.2.7 All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

11.8.3.2.8 All welding of the personnel platform and its components shall be performed by a qualified welder familiar with the weld grades, types and material specified in the platform design.

11.8.3.2.9 The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

11.8.3.3 Personnel Platform Loading

11.8.3.3.1 The personnel platform shall not be loaded in excess of its rated load capacity. When a personnel platform does not have a rated load capacity then the personnel platform shall not be loaded in excess of its maximum intended load.

11.8.3.3.2 The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.

11.8.3.3.3 Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.

11.8.3.3.4 Materials and tools for use during a personnel lift shall be secured to prevent displacement

11.8.3.3.5 Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform is suspended

11.8.4 Rigging

11.8.4.1 When a wire rope bridle is used to connect the personnel platform to the load line, each bridle leg shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.

11.8.4.2 Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

11.8.4.3 Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting without failure at least ten times the maximum intended load.

11.8.4.4 All eyes in wire rope slings shall be fabricated with thimbles.

11.8.4.5 Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.

11.8.5 Trial Lifts, Inspection and Proof-Testing

11.8.5.1 A trial lift with the unoccupied personnel platform loaded at least to the anticipated lift weight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned.

11.8.5.2 This trial lift shall be performed immediately prior to placing personnel on the platform.

11.8.5.3 The operator shall determine that all systems, controls and safety devices are activated and functioning properly; that no interferences exist; and that all configurations necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist's rated capacity.

11.8.5.4 Materials and tools to be used during the actual lift can be loaded in the platform for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single set up position.

11.8.5.5 The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location.

11.8.5.6 Additionally, the trial lift shall be repeated when the lift route is changed unless the operator determines that the route change is not significant (i.e. the route change would not affect the safety of hoisted employees.)

11.8.5.7 After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced.

11.8.5.8 Employees shall not be hoisted unless the following conditions are determined to exist:

11.8.5.8.1 Hoist ropes shall be free of kinks;

11.8.5.8.2 Multiple part lines shall not be twisted around each other

11.8.5.8.3 The primary attachment shall be centered over the platform; and

11.8.5.8.4 The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.

11.8.5.9 A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

11.8.5.10 Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.

11.8.5.11 At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift).

11.8.5.12 After proof testing, a competent person shall inspect the platform and rigging

11.8.5.13 Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

11.8.6 Work Practices

11.8.6.1 A cold work permit and level 2 risk assessments is required for all lifting of personnel using a crane.

11.8.6.2 Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

11.8.6.3 Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.

11.8.6.4 Tag lines shall be used unless their use creates an unsafe condition.

11.8.6.5 The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

11.8.6.6 Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger.

11.8.6.7 Employees being hoisted shall remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for that person, direct communication alone such as by radio may be used.

11.8.6.8 Employees occupying the personnel platform shall use a body belt/harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage.

11.8.6.9 Working over water is prohibitive.

11.8.6.10 No lifts shall be made on another of the crane's or derrick's load lines while personnel are suspended on a platform.

11.8.7 Travelling

11.8.7.1 Hoisting of employees while the crane is traveling is prohibited.

11.8.8 Pre-lift Meeting

11.8.8.1 A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review the appropriate safety requirements, procedures and risk assessment.

11.8.8.2 This meeting shall be held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.

11.9 Ladders

11.9.1 General requirements

11.9.1.1 Ladders shall comply with BS 1129 or equivalent and shall be properly stamped

11.9.1.2 Select the right ladder for the job.

11.9.1.3 Ladders shall extend at least 1 meter above the top of the landing platform

11.9.1.4 The use of hand made ladders is prohibited

11.9.1.5 Make certain the ladder is strong enough for its intended use by reviewing the load rating on the ladder.

11.9.1.6 Inspect the ladder before you use it

11.9.1.7 If defective, remove from service.

11.9.1.8 Be sure straight ladders have safety feet installed.

11.9.2 Using Ladders

11.9.2.1 Use a barricade or guard to prevent collisions

11.9.2.2 When blocking an emergency exit, ensure the ladder is continually attended. Whenever the worker leaves the area, clear the emergency exit path.

11.9.2.3 Keep the area around the ladder base uncluttered.

11.9.2.4 Always place your ladder base on a solid, level surface.

11.9.2.5 Ensure step ladders are fully open and spreaders are locked before use.

Position a straight ladder on one-to four ratios. That means the base of the ladder is 1 meter away from the wall or other vertical surface for every 4 meters of the ladders height to the upper support point.

11.9.2.6 When you use a ladder to climb onto a roof or platform, allow the ladder to extend at least 1 meter beyond the roof edge or other support point.

11.9.2.7 To avoid shifting, tie-down straight ladders as close to the support point as possible.

11.9.2.8 Never lean a ladder against an unstable surface.

11.9.3 Working from a Ladder

11.9.3.1 Hold on with at least one hand

11.9.3.2 Only reach or lean so that your belt buckle remains between the ladder rails.

11.9.3.3 Maintain your balance by centering the body between the ladder rails.

11.9.3.4 Climb or descend ladders cautiously.

11.9.3.5 Face the ladder and use both hands

11.9.3.6 Carry tools in a tool belt, or raise and lower them with a hand line.

11.9.3.7 Check ladder rungs and the bottoms of your shoes for slippery substances

11.9.3.8 Do not climb higher than the second tread from the top of a stepladder or the third rung from the top of a straight ladder.

11.9.3.9 Climbing devices, cages or platforms are required for fixed ladders over 6 meters in height. Use the ladder-climbing device if provided.

11.9.3.10 Inspect the ladder for damage every 6 months.

11.9.3.11 Keep an inspection register showing the last inspection date. Damaged ladders must be destroyed.

11.10 Training

All personnel who use fall arresting equipment, working on scaffolding, erecting and dismantling scaffolding, operating the man-lifts, and working from ladders need to be trained in the hazards, risk and safeguards for each and be familiar with this practice

Table 1 Qualifications

Qualifications	Training Types	Experience
Trainee scaffolder	Basic scaffolding Part (1)	Up to 6 months from start of experience (In-house)
Basic scaffolder	Basic scaffolding part 2 & CITB	Min. 6 months from completion of part (1)
Advanced scaffolder	Advanced scaffolding & CITB	Min. 12 month from completion of part (2)

Table 2 Materials for Tube and Fitting Scaffolds.

Components	Standard	Additional requirements
Steel tube	BS 1139 parts 1&2	Galvanised and painted tube to be used. Used tubes to be regularly inspected and cleaned. All tubes to be checked before use for corrosion and general conditions. Defective tubes to be discarded.
Boards	BS 2482	To be cleaned and free of nails, wrappings and significant cracks. Not to be painted or treated.
Metal fittings	BS 1139 parts 1&2	To be examined before use for damage or wear. Damaged or worn fittings to be discarded. No heat to be applied to fittings. Regular lubrication of moving parts.

Table 3

Duty	Distributed Loads On P/F KN/M2	Max. No. Working On P/F	Max. Height (M)
Inspection and very light duty	0.75	1	50
Access birdcage scaffold	0.75	1	50
Light duty	1.5	2	50
General purpose	2	2 + 1 at very light duty	50
Heavy duty	2.5	2 + 1 at very light duty	50

Appendix 1:

Scaffold inspection report

TO _____SITE PLATEFORM_____ LOCATION _____
COPY TO _____SCAFF CONTR DATE_____ CONTR_____
SCAFF TYPE _____ IINSPECTOR _____ DIV. _____

A= ACTION NEEDED
P= POOR
AV= AVERAGE
G= GOOD
VG= VERY GOOD

1. TIES	TYPE	LEVEL	ELEVATIONS	COMMENTS
GIRDERS TIES - GT COLUMN TIES - CT STRUCTURAL TIES – ST WINDOW TIES - WT BUTTRESSES - B				
2. BASE	8. PLAN / KNEE BRACING		14. BEAMS	
3. STANDARDS	9. WORKING PLATFORMS		15. CHECK FITTINGS	
4. LEDGERS	10. GUARDRAILS		16. RAKERS	
5. TRANSOMS	11. TOE BOARDS		17. LOADING	
6. SWAY BRACING	12. LADDERS		18. FITTINGS	
7. LEDGER BRACING	13. GIN WHEELS / ROPES		19. HOUSEKEEPING	

20. SCAFFTAG LAST SERVED BY

THIS SCAFFOLD HAS BEEN INSPECTED AND IS :

☐ PASSED FIT FOR USE
☐ UNSATISFACTORY - NOT USED

____ _____
DATE AUTHORISED INSPECTOR SIGNATURE

COPY 1 : SITE COPY 2 : SCAFFOLD CONTRACTOR COPY 3 : INSPECTOR

CHECK LIST FOR SCAFFOLD INSPECTION			
1. CORRECT SPACING FASTENED TO TWO LEDGERS LOAD BRACING FITTING USED	6. COMPLETE TO TOP INTERMEDIATE FITTINGS SLEEVES EVERY 30M	11. FASTENED TWICE STOP END BOARDS	16. TIED BACK LOAD BEARING FITTINGS CHECK FITTINGS
2. FIRM GROUND SOLE PLATE BASE PLATE	7. COMPLETE TO TOP ALTERNATE PAIR OF STANDARDS CLOSE TO NODE POINT	12. 1.1 M ABOVE PLATFORM CORRECT ANGLE	17. CHECK GRID

		TIED TWICE PETROJET STANDARD	
3. PLUMB SPACINGS STAGGERED JOINTS FOOT TIES	8. CORRECT FITTINGS COMPLETE THROUGH AREA CLOSE TO NODE POINT	13. CORRECTLY TIE TO SCAFFOLD CORRECT SIZE ROPE	18. TIGHT TO TORQUE CORRECT SELECTION CORRECT USE
4. HORIZONTAL LIFT HEIGHT STAGGERED JOINTS SLEEVES	9. COMPLETE PLATFORM BUTTED BOARDS ALL B.S. BOARDS	14. CHORD STIFFENERS PURLIN SPACING BRACINGS CONNECTIONS TO SCAFFOLD	19. TIDY SITE MATERIAL OFF LIFTS WALKWAYS CLEAR
5. CORRECT SPACING CORRECT FITTINGS	10. PROPERLY FASTENED STOP ENDS CORRECT HEIGHT	15. ON PUNCHEONS, RAKERS LOAD BEARING FITTINGS	COMMENTS

12. Smoking, Alcohol and Drugs in the Workplace

PJ – HSEMS 4.4.6.16

12.1 Purpose.

Petrojet is committed to maintain a safe and productive working environment for employees and others that may come into contact with our facilities activities. Because Smoking and the use of alcohol, illegal drugs and controlled substances has been shown to substantially increase workplace accidents and reduce employee dependability and productivity, the following policy is implemented to safeguard the health of our employees and others, and to provide a safe, healthy and productive working environment.

Compliance with this policy is a condition of employment, as the Company will not assume any risk created by Smoking, the presence of illegal drugs, alcohol and controlled substances in the workplace.

The Company reserve the right at all times to conduct auditing or inspections without prior announcement of the personal effects, lockers, baggage and vehicles of any person subject to this policy, for the purpose of determining if such person is in possession of a prohibited item or substance.

Illegal and unauthorized items include, but are not limited to Smoking except in the designated areas, illegal drugs, narcotics, look-alike and designer drugs, controlled substances, contraband such as drug-related paraphernalia and alcohol

12.2 Scope.

This policy applies to all employees of the company, contract employees, contractors including their employees, and all applicants for employment.

12.3 References.

3.1: ISO 14001:2004
3.2: OHSAS 18001:2007
3.3: Law 4/1994 for environment

3.4: Labor Law 12/2003.

12.4 Definitions.

None

12.5 Policy

Prohibition against Smoking, Presence of Alcohol, Illegal Drugs and Controlled Substances.

To ensure a safe, productive work environment and to safeguard Company property, the Company strictly prohibits Smoking Except in the designated areas and the use, sale, transfer or possession of alcohol, illegal drugs, drug paraphernalia or controlled substances on Company premises, work sites, or customer premises.

Company vehicles, as well as private vehicles parked on Company premises, work sites, or contractor premises, are included within the prohibition.

The Company further prohibits any employee from being on duty, whether on or off Company premises, work sites or contractor premises, under the influence of alcohol or with any detectable amount of illegal drugs or controlled substances present in his/her body.

Any violation of this policy will result in a different type of penalty.

Any non-employee (including visitors, contractors, employees of contractors, etc.) found in violation of this policy, or suspected of being impaired under the influence of alcohol or who has a detectable amount of illegal drugs or controlled substances present in his/her body, may be refused entry onto or removed from the Company's premises and denied future access.

Furthermore, depending on the circumstances, other action, including notification of appropriate law enforcement agencies, may be taken against any violator of this policy

12.6 Smoking, Alcohol and Drugs in the Workplace

A. Introduction

Purpose

This Procedure describes PETROJET's requirements for managing smoking, alcohol and drugs in the workplace.

Scope

This Procedure applies to all PETROJET and Contractors staff.

This Procedure addresses the following:

- Smoking
- Alcohol and Drugs

Reports

PETROJET staff: Any non-compliance with this Procedure shall be notified, investigated and reported.

Contractors: Any non-compliance with this Procedure shall be reported to the Contract Holder

Responsibilities

Departments Managers are responsible for ensuring that the activities they control are managed in accordance with the requirements of this Procedure.

are responsible for ensuring that the requirements of this Procedure are reflected in the documents for which they are responsible.

Contract Holders are responsible for communicating this Procedure to Contractors, and for ensuring that the requirements of this Procedure are adhered to within the scope of their contracts.

Contractors are responsible for ensuring that activities undertaken within the scope of their contracts are managed in accordance with the requirements of this Procedure.

In the event that circumstances prevent compliance with this Procedure, Departments Managers, Contract Holders and Contractors shall seek step-out approval.

Performance Monitoring

Performance Indicators shall be developed and maintained to demonstrate compliance with this Procedure.

Review and Improvement

Any user of this document who encounters a mistake or confusing entry is requested to immediately notify the Document Custodian.

This document shall be reviewed as necessary by the Document Custodian, but no less frequently than every four years.

Reporting Format

There are no routine reporting requirements against this Procedure

B. Smoking:

I. Health Effects of Cigarette:

Cigarette smoking is the single most important cause of death worldwide.

When smokers and non-smokers share the same room, non-smokers cannot avoid inhaling some of the tobacco smoke. This is "passive smoking". The smoke contains small droplets of tar together with nicotine and a wide range of vapors and gases such as carbon monoxide, ammonia, hydrogen cyanide and acrolein.

Passive smoking can cause lung cancer in non-smokers. Passive smoking can also result in acute irritant effects on the eyes, throat and respiratory tract and can aggravate asthma..

II. Requirements

A working environment shall be created whereby non-smokers are able to work in a smoke-free environment.

Smoking shall not be allowed Except in the designated areas .

“No smoking” signs shall be displayed in all workplace buildings and at all work-sites where smoking is not permitted.

Assistance shall be provided to any member of staff who requests help to give up smoking.

C. Drugs & Alcohols

I. Legal Drugs

Any employee taking a drug or other medication, whether or not prescribed by a physician, which is known or advertised as possibly affecting or impairing judgment, coordination, or other senses, or which may adversely affect ability to perform working in a safe and productive manner, must notify his supervisor prior to starting work or entering the Company's premises or work site.

The Supervisor will decide if the employee can remain at work and what work restrictions, if any, are deemed necessary or appropriate.

Any employee violating this policy is subject to disciplinary action up to termination.

II. Testing

The Company requires all applicants for employment to submit to testing for illegal drugs and alcohol as part of their pre-employment employment is conditional upon passing this test.

Employees and applicants must report to the testing site immediately once notified to submit to a drug and/or alcohol test. Failure to follow this policy will be considered a positive test result.

The company additionally prohibits any adulterating or switching of any blood, urine or other samples.

- **The Company also may require any employee to submit to testing for illegal drugs and alcohol in the following circumstances:**

i. Pre-Employment

- Whenever an applicant is hired or contracted to perform work for the Company or its contractors. Also, whenever an employee returns to work from a leave of absence.

ii. Post Accident

- Following any accident regardless of fault where property damage occurred or an injury where medical attention is required. This includes all employees involved.
- After returning from the collection site, the employee(s) shall not be allowed to perform safety sensitive duties pending the results of the test in writing.

iii. Pre-Access

- Whenever required or requested by the company to the contractor as a condition for entering the premises or to performing a services. (If an employee test positive during a pre-access test the employee will not be permitted to enter the customer's premises.)

iv. Random

- On a random selection basis and anytime deemed appropriate by the management of the Company, without prior announcement.

- Employees are required to sign an acknowledgement form consenting to breath, urine and/or

blood drug/alcohol testing.

- Any employee who refuses to consent to a required drug/alcohol test will be terminated. The purpose of the test is to determine whether a person has any detectable amount of illegal drugs, alcohol or any controlled substances present in his body.

Confidentially of Information Regarding Drug and Alcohol Testing

Employee confidentially shall be maintained as per government regulation.

a) Positive Results

All test results showing positive with a preliminary screen will be confirmed by using the methodology. Any employee that has a question concerning the drug testing process, including the method to confirm a positive result should contact the Company's supervisor.

b) Consequence of Positive Results

Employees in violation of this policy will be subjected to warning for termination in case of reoccurrence. Employees who request re-hire shall provided evidence to the company of negative result drug test and proof of attendance of Drug Awareness/Abuse Counseling.

c) Acknowledgment of Receipt and Explanation

Each employee is to receive a copy of the Company's policy regarding alcohol and illegal drugs and prohibited substances in the workplace. Any questions regarding this policy should be directed to the company supervisor.

It is understood that continued employment with the Company is conditioned on the employee's acceptance of and compliance with the provisions of this policy.
Failure to sign or return the Drug-Alcohol acknowledgment form in no way reduces or removes responsibility for compliance with the above referenced policy, and that a violation of this policy will result in immediate warning for termination.

13. Welding & Cutting Operations

PJ - HSEMSP4.6.6.17

13.1 Purpose.

Defining the operations and operational activities which have Occupational Risk, and the followed methods to control it.

13.2 Scope.

WELDING & CUTTING is one of the operational activities/ aspects which affect the HSE.

13.3 References.

13.1: ISO 14001:2004
13.2: OHSAS 18001:2007
13.3: Law 4/1994 for environment
13.4: Law 12/2003.

13.4 Definitions.

None

13.5 Procedure and Responsibilities

13.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSE and issue the instructions concerning it.

13.5.2 The concerned Departments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks.

13.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

13.5.4 Making sure that the work locations provide the HSE correct conditions and that operations of starting and finishing operating as well as the contingency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

13.5.5 As for operations of obvious Occupational Risk the employees should be qualified and trained to execute it, according to the operating Work Instruction.

13.5.6 Suppliers and contractors should be notified by the proceduresand requirements of PETROJET HSE System related to their dealings with the company, within the description clarified in the supply order.

13.5.7 Monitoring and measuring operations which affects the HSE, according to the HSE Monitoring and Measurements Procedure.

13.5.8 The HSE Manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSE obligations and other requirements.

13.5.9 All the machines and equipments in the company are subject to Periodic Preventive Maintenance.

13.6 Welding & Cutting

13.6.1 Purpose

The purpose of this HSE .document is to provide a consistent and effective guideline on the associated hazards and precautionary measures related to cutting and welding.

13.6.2 Scope

This Safe Instructions is applicable to all situations where PETROJETHSE General Department is responsible for the implementation of a HSE. Management system.

13.6.3 Responsibility

The line management of each Dept./Unit is responsible for its authorizations and implementation

The Project HSE representatives are responsible for monitoring and auditing the compliance with these requirements in addition to constant review and updating of this document in co-ordination with the appropriate disciplines.

13.6.4 Approach.

13.6.5 Introduction.

Important factors for the safe execution of electric and gas welding, cutting, brazing and soldering operations are:

A. Properly trained personnel.
B. Equipment well maintained and functional.
C. Good ventilation and lighting.
D. A tidy work area.
E. Adherence to good work practices and safety Safe Instructions

Welding, bumming or other operations that generate heat or sparks, e.g. abrasive cutting in hazardous areas shall be carried out under a hot work permit.

13.6.5.1 General Safety Precautions.

1. At operational units/sites, all tanks vessels and equipment on which welding cutting, burning , brazing and soldering work is carried out, must be either free from flammable gases and vapors, and cleaned of all traces of liquid, wax or solid hydrocarbons, or provision made for excluding oxygen e.g.. Pipeline/vessel filled with nitrogen, high expansion foam or product.
2. Consideration should be given to the build-up of toxic or flammable gases when vessels and tanks are being welded or burned on the outside and suitable precautions taken.
3. Under no circumstances will compressed oxygen be used for ventilation or to blow through acetylene hoses. Explosions can occur when acetylene gas is present in air in any proportion between 2.5% and 80% by volume.
4. Ignition of oxyacetylene or propane torches must only be made using the gas lighters (flint lighter) which are supplied for this purpose.
5. In all welding or burning operations, consideration must be given to the space between double plates or weir plates, where flammable materials may be found inspection by the operating authority will be necessary to decide on the precautions to be taken, including the need to gas test the space and ensure it is gas free.
6. Before cutting the bottom plates of any tanks, test holes must be first drilled and gas tests taken, to ensure that conditions are safe under the tank floor.
7. No welding or burning will be permitted on pipelines where mechanical seal plugs are to be used, or where hot tapping Safe Instructions are to be employed on live lines, without written authorization from the site manager.
8. All welding, burning and cutting shall be carried out only by suitable qualified personnel, using only equipment of an approved type, which must be in a serviceable condition.

13.6.5.2 Protective Clothing and Equipment.

1. Personnel engaged in welding, cutting, chipping and grinding operations must wear/use the appropriate protective clothing/ equipment provided e.g... Goggles, face shields, welding helmets, welding screens, gloves, leather aprons, etc. Other personnel in the vicinity who could be affected by this work shall also wear the required protective clothing/equipment.
2. Gloves or gauntlets made of leather or some other non-ignitable material are required for shielding. The hands and arms from sparks and heat radiation of the welding arc. Sleeves or similar material should be used in addition to gloves if gauntlets are not worn.
   Note: leather gloves and gauntlets give no protection against electrical hazards.
3. The necessity for protective clothing against sparks and pieces of hot metal, depends upon the position of the arc in reference to the welder's body. For some classes of welding, e.g.. Where the welder is standing at a bench, the head screen and gauntlets may well provide sufficient protection. A thick apron of leather or other suitable material may be needed if the welder is sitting at the work position, where molten metal may fall upon his thighs and legs. If the arc is above the level of his shoulders or overhead, complete protection for the head, arms and upper part of the body is necessary.
4. Apart from eye flash. Another common cause of eye injury is chipping away of slag which covers the weld when coated electrodes are used. In these circumstances a helmet with a double screen should be used, the inner consists of a clear safety glass window.
   While the out contains an optical glass which absorbs arc radiation. The screen can be simply adjusted to bring either or both screens into use. Alternatively, clear glass safety goggles may be worn in conjunction with the use of a hand screen.

13.6.5.3 Fume and Gas Risks in Welding and Cutting Operations.

1. Welding, cutting and brazing operations etc. can produce mixtures of fumes and gases, the composition of which depends on the welding temperature, arc intensity, electrode material and the gas mixture being used. Many of the fumes and gases produced are toxic.
2. Where gases/fumes are produced. They must be effectively disposed of either by natural ventilation or forced mechanical extraction ventilation the aim being to draw away the gas/fume from the operator. Suitable respiratory protection should be available as a backup to the ventilation system employed, in case of inadequate air mixing or the failure of the forced ventilation system.
3. Examples of such fumes and gases and how they are produced are as follows:

A. Fumes are derived from the evaporation of the electrode and it's coating, from the parent metal being welded/cut or from contamination of the parent metal by grease, paints etc.

(i) The fumes consist of considerable quantities of very fine particles from the electrode coating. The coatings are varied and the particulate given off will depend upon their composition, such as iron oxides, silicates, Ferro-manganese, carbonates of sodium, potassium, calcium, magnesium, etc.

(ii) The inhalation of many freshly format metallic oxides, e.g..Zinc, chrome, nickel, Copper, manganese etc. May lead to a general illness called metal fume fever. The most common cause met by welders and other, is work on zinc-galvanized materials, more particularly in confined space situations.

(iii) Metal fume fever is characterized by raised temperature, aching muscles, shivering and sweating. These symptoms develop a few hours after exposure to the fumes and normally disappear after approximately 24 hours.

(iv) Cadmium fume however, is dangerous even when operations take place in open air. Where the welding or cutting of cadmium alloys or cadmium coated materials takes place, suitable respiratory protection must be worn.

(v) Cutting painted metals with oxy-acetylene torches can lead to the formation of very toxic fumes from the thermal breakdown of the paint. These should be avoided wherever possible by cleaning the metal surface before cutting.

B. Gasses evolved during welding and cutting may be produced from :

(i) Normal atmospheric gases, e.g.., nitrogen oxides and ozone.

(ii) Shielding gasses, e.g. carbon monoxide from carbon dioxide.

(iii) External sources..

13.6.5.4 Prevention of Fire and Explosions.

1. Welders and helpers must, at all times, be alert to the dangers of fire and explosion. Within Hazardous Areas, no welding or cutting may be done without a hot work permit, and the conditions laid down on that permit must be strictly observed.

2. Welding booths and screens must be of a fire resistance construction and the interior surfaces should be such as to minimize the reflection of dangerous rays. There shall be means of thorough ventilation.

3. Work must be screened to prevent sparks from flying outside the immediate welding area and all combustible material must be removed if there is danger of ignition. Any drains in the area must be covered with fire resistant material and loop seals topped up with water.

4. When working at a height, precautions must be taken to prevent welding rods and spent stubs from falling. Non-combustible screens must surround the work, area to prevent scatter

of sparks and hot metal, particular attention being paid to the area immediately below the welding area.

5. An active fire-watch shall be maintained by a nominated person (others may be required of there is a danger that sparks etc. Can fall to areas below the welding or be carried by the wind over a large area), whose sole duty consists of fire watching. This person shall be provided with suitable portable fire extinguishers, and in addition fire blankets and a pressurized fire hose may be provided as necessary, depending on location/site conditions. Following cessation of work, the work area and any adjacent areas that may be affected shall be inspected by the firewatcher to ensure that the areas are left in a safe condition.
6. No fuel or oxygen gas cylinders shall be taken into any confined space. Cylinders, hoses and fittings must be checked for leaks, especially from hoses and fittings within a confined space.
7. Blowpipe and hoses must not be left in vessels or enclosed spaces, when they are not in use, e.g..After use, during a meal break or overnight. A very small leak of any gas or oxygen, particularly acetylene, from a torch over such a period, can make the atmosphere in the vessel dangerous. Where this cannot be done, the oxygen and acetylene connections must be disconnected at the cylinders situated outside the vessel.

   Note: Merely closing the valve is not a disconnection.
8. Work permits must contain the requirement for the testing of the atmosphere for gas and oxygen enrichment following breaks in gas welding operations in confined spaces.
9. The blowpipe from any oxygen, propane or acetylene cylinder, when alight, must not be hung on the cylinder or regulator.
10. Welders must never coil hoses around their body when welding.

11. Whenever equipment is to be left unattended, gas cylinder valves should be shut, electrical power for welding switched off, and any diesel-driven welding sets shut down.

Color code

Gas	Cylinder
Acetylene	Maroon
Carbon dioxide	Grey
Argon	Green
Nitrogen	Yellow
Oxygen	White

Gas cylinders, the contents of which are not clearly identified should not be used.

In addition to the colour coding, cylinder and cylinder fittings are different for the oxygen and fuel gases.

a. Oxygen fittings have right-hand threads, and the cylinder fitting has a plain hexagon nut; whereas:

b. Fuel gas fittings have left-handed threads, and cylinder fitting has a grooved hexagon nut.

3. Oxygen and fuel gas hoses and their associated equipment are designed for safety with their own gases and are not interchangeable.

13.6.5.5 Safety Features That Must Be Incorporated In Gas Burning/Welding Equipment.

The following safety features must be incorporated:

a. Pressure regulators that filter the gas and provide a constant delivery pressure in accordance with BS 5741: 1979 or equivalent standards

b. Pressure regulators, which incorporate safety diaphragms, which burst before the bonnet is, blow off.

c. Pressure gauges with safety backs, which deflect the bursting, gases.

d. Hose check valves (non-return valves) which allow gases to the blowpipe, but not back from it.

e. Flashback arrestors which quench flashback flames and cut off the gas flow automatically, must be incorporated in both oxygen and fuel gas lines.

13.6.5.6 Electrode Holders.

1. Electrode holders shall be provided with a handle of tough insulating non-ignitable material.
2. A fully insulated holder or hook should be provided to accommodate the live electrode holder when not in use. The practice of laying the live electrode holder on gloves, face screen or hanging it up by the electric cable where it could come in contact with other equipment etc, is to be discouraged.

13.6.5.7 Earthing and Bonding.

1. For all a/c welding transformers, the transformer low voltage winding must not be earthed but the transformer case must be effectively bonded to an earthing system adjacent to the equipment.
2. For all A/C driven A/C welding generators, no earth connection must be applied to either pole of the d/c welding output. The machine frame must be effectively bonded to earth.
3. The work piece must be bonded to earth my means of a heavy section conductor having suitable clamped or bolted connection.
4. For engine driven D/C welding generators, no earth connection must be applied to the generator output terminals.
5. Under no circumstances shall pipelines or structures be used for earthing purposes.

13.6.5.8 Portable Welding Quiver Ovens.

1. Where portable welding quiver ovens are used, they shall conform to a recognized standard and shall be maintained in good conditional. Electrical supply cables should also be regularly inspected and maintained in good condition.

13.6.5.9 Repairs to Small Containers.

1. This includes the welding, brazing, soldering or cutting of drums or containers (e.g. 200 litre “45 gallon” drums, petrol tanks of vehicles) which have contained petroleum products, or other flammable or combustible materials. Before any work mentioned above is carried out, the drum or container should be thoroughly steamed out after removal of the filler caps and draining, or failing this, submerged in boiling water and kept at boiling point for at least 1 hour. After the steaming or boiling process, compressed air shall be blown through the drum or container must be certified ‘gas free’ and the appropriate hot work permit completed.

   When burning or welding is in progress on a small vessel, unburned gasses can collect inside and explosive mixture can be formed. Compressed air or steam should be passed through the vessel, care being taken to ensure a free and adequate exit for the air or steam. Compressed oxygen must not be used for purging.
2. Compressed air purging washing out with hot/cold water or allowing water to run through a vessel, are not recommended as methods of preparation for repair purposes. Such methods are unlikely to ensure the vessel is sufficiently cleansed of flammable materials to preclude the formation of vapour during the course of the repair, especially repairs which involve the application of heat such as welding.
3. All vessels sent to the workshop for repair must be certified free of gas and free of corrosive chemicals.

Optical filters for arc radiation

Welding process	Approx. Rang of welding Current (in amperes)	Filter (s) Ew
Manual metal arc (mma)	Up to 100 100-200	8 9 10 11
Submerged arc (sa)	Up to 200 over 200	10 11 12 13 14
Tungsten lnnert gas (TIG)	Up to 15 15-75 75-100 100-250 250-300	8 9 10 11 12 13 14
Metal inert gas (mig) Metal active gas (mag) (including argon and carbon dioxide shielded)	Up to 200 Over 200	10 11 112 13 14

Flux cored arc welding including gas shielded	Up to 100 100-300 Over 300	8 9 10 11 12 13 14

14. Chemical Handling and Hazardous Material

PJ - HSEMSP4.6.6.4

14.1 Purpose.

Defining the operations and operational activities which have Significant Impact on the Environment and/or High Occupational Risk.

14.2 Scope.

CHEMICAL Handlings one of the operational activities/ aspects which affect the HSE.

14.3 References.

3.1: ISO 14001

3.2: OHSAS 18001

3.٣: Law 4/1994 for environment

3.٤: Law 12/2003.

14.4 Definitions.

None

14.5 Procedure and Responsibilities

14.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSE and issue the instructions concerning it.

14.5.2 The concerned Departments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks/ Environmental Impact.

14.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

14.5.4 Making sure that the work locations provide the HSE correct conditions and that operations of starting and finishing operating as well as the contingency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

14.5.5 As for operations of obvious Occupational Risk and/orEnvironmental Impact, the employees should be qualified and trained to execute it, according to the operating Work Instruction.

14.5.6 The HSE Manager and construction manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSE obligations and other requirements.

14.6 Chemical Handling

14.6.1 OBJECTIVES THE PURPOSE OF THIS PROCEDURE IS:-

14.6.1.1 To highlight some of the principal hazards to the use of chemical substances.

14.6.1.2. To propose a number of safety measures relating to the identification, storage and handing of chemicals.

14.6.2 INTRODUCTION

Chemical substances are used regularly throughout for a wide variety of purposes. Typical examples are fuels, solvent, cleaning agents, lubricants and paints. Although many chemicals come in liquid form, others may be present as solids or gaseous,

some chemicals may be present as a result of production processes, while others can be produced as a result of environmental factors, e.g. hydrogen sulphide gas can be generated in stagnant water containing traces of oil through the activities of sulphate reducing bacteria.

Virtually all-chemical substances are toxic to the human body. A toxic substance is one, which has a biological effect on the body, possibly causing breathing problems (asphyxiation), or damage to various tissues in the brain, kidneys, lungs or nervous system. All chemicals can have a biological effect on the body. The degree of risk or hazard will depend on how they are handled and the extent to which the body is exposed to them. One of the principal objectives of scientists engaged in occupational hygiene work is to reduce exposure levels to toxic substances to a minimum, by substituting less toxic materials, providing the protection against their effects, and / or reducing the time to which the body is exposed to them.

14.6.3 . Hazardous Material & Precautionary Measures

14.6.3.1 Effects on the body:

The effects on the body of exposure to chemicals can be chronic or acute, include immediate discomfort, e.g. burning sensations, sore, etc while chronic effects from long term exposure and are usually not apparent until many years later. The effects of exposure can also be classed as local or systemic. A local effect is damage to an external part of the body, e.g. an acid burn on part of the skin, while a systemic effect is damage inside the body, e.g. to one of the body's internal organs.

Chemicals can be absorbed through the skin, inhaled into the lungs, or ingested through the mouth. However there are a number of inbuilt mechanisms, which protect the body from absorption of some classes of chemical through the skin. For example it is nearly impervious to hydroxyl, carboxyl and ionized substances, while hydrocarbons, fats and esters will go through it with relative ease.

The first effect of acute poisoning is usually severe stress, similar to shock, circulation and respiration and loss of the brain's blood supply. However, by blood shunting, the liver and kidneys are among the first organs to have their blood supply cut off to protect these organs from chemical damage. Long periods in this condition can cause them to atrophy or be damaged in other ways.

14.6.3.2 Occupational Exposure Limits:

Guidance notes on occupational exposure limits are updated annually.

Occupational exposure limits refer to control and recommended control limits.

There are two types of exposure limit listed in the HSE guidance note - long term and short term. The long-term exposure limit is concerned with the total intake of the chemical over a long period and is normally based on periods of eight hours per day for situations where only very short exposure is required. Tables of short term exposure limits, based on the maximum level of exposure over a 10 minute period, should be referred to, e.g. for hydrogen sulphide the short term exposure limit is 15 PPM.

In cases where work shifts exceed 8 hours per day, the exposure limit must be reduced in proportion to the extra time a person is present in a contaminated environment, e.g. the occupational Exposure limit for hydrogen sulphide gas in air is 10parts per million (PPM). As this is for an 8 hours day, the limit would need to be reduced to 7 PPM if the normal working patterns require a 12 hours shift day.

14.6.4 . IDENTIFICATION AND LABELING:

Typical information to be included on labels includes;

- Name and address of manufacturer and/ or supplier.

- Trade and chemical names of the substance.

- An indication as to the particular risks involved in handing or using the substance.

- Warning about safety factors to be observed.

- Pictorial representation of the main hazard (s).

All chemicals should be appropriately labelled, even when they are not considered to be dangerous, since unlabelled chemicals invite the assumption that they are harmless in every situation.

14.6.4.1 Location and Type of Label:

Labels must be securely fixed to containers and clearly visible. They should be made of a material, which is capable of surviving 3 months immersion in seawater. Tie on labels are not advised as they can be easily damaged or removed. Labels should remain on empty containers, as the risk to handlers may be just as great if the containers were still full.

14.6.4 TYPES OF HAZARD:

- Hazardous material is classified according to Material Safety Data Sheets which associated with hazardous material when supplied to PETROJET company into:-

14.6.4.1Flammable material:

Practically all combustion takes place between oxygen and a fuel in its vapour or other finely divided state. Excess heat may cause some of the chemical to vaporize and can easily lead to the presence of a flammable atmosphere, e.g. paint thinners. The flash point of a chemical classified as flammable should be less than 38 c (100f).

14.6.4.2Toxic materials:

Any substance, which has an effect on the body should be classified as toxic, e.g. for hydrogen sulphide the effect may be a short term acute response such as eye irritation, or the result of long term exposure may be chronic leading to the development of some form of occupational disease.

14.6.4.3Corrosive materials:

These include string acids and alkalis, e.g. caustic soda. These materials tend to destroy their containers and leak into the storage area. Some are stable, while others react violently with moisture. Acid mists corrode structural materials and equipment as well as being harmful to personnel.

14.6.4.4Harmful/ irritant substances:

The combined transport and user label identifies materials not covered by other classifications, but may still cause some minor damage to the body, e.g. ethylene glycol (anti - freeze) can be irritating to the eye and to the skin.

14.6.4.5Oxidizing agents:

Oxidizing agents releases oxygen, either at room temperature or when subjected to heat. They should always be stored in a separate area from other chemicals, as they can provide the oxygen needed to fuel a fire in the event of unfavorable conditions occurring, examples are chlorates.

14.6.4.6 Explosives:

This classification includes materials, which, under certain conditions of temperature, shock or mechanical action, can decompose rapidly to cause an explosion. Explosives

should be stored in a separate area, well away from highly populated locations and only be used by trained personnel.

14.6.5 STORAGE OF HAZARDOUS SUBSTANCES;

- According to Material Safety Data Sheets (MSDS) associated with hazardous material when supplied to PEROJET Company.

In addition and not limited to the following:-

14.6.5.1 Storage areas:

- Hazardous chemicals should be stored in separate storage areas away from densely populated or high-risk areas.

- The floor should be sealed, to prevent leakage of spilled chemical into other areas, and there should be rallied sills on doorways, to provide bundling or containment within the store.

- The area should be well ventilated to prevent the build up of toxic, flammable or explosive fumes.

- The storage area should comply with manufacturer's recommendations regarding temperature, humidity, etc.

- There should be sufficient access space to prevent containers being accidentally dislodged and damaged.

- Incompatible chemicals e.g. flammable substances and oxidizing agents should not be stored in same area. (Separate between different hazardous materials)

14.6.5.2 Receipt and storage arrangements:

- Newly received containers should be checked for leaks before they are brought into storage.

- Chemicals should be stored in their original containers.

- Containers should not be stored above head height.

- If there is a danger of certain old chemicals corroding containers, decomposing, owing or giving off gas, these must be used in strict rotation ands only small stocks held.

- All areas must be free from litter, and spills must be wiped up as they occur.

- Empty containers should be removed, and disposed of as hazardous waste.

- Appropriate hazard warning signs must be disposed of as hazardous waste.

- Appropriate hazard warning signs must be displayed on all access doors.

- Hazardous chemicals should not be dispensed or mixes, in the storage area.

14.6.6 . HANDLING AND MIXING:

- According to Material Safety Data Sheets (MSDS) associated with hazardous material when supplied to PEROJET Company.

In addition and not limited of:-

- Chemicals should not be mixed or diluted unless the label clearly states that it is safe to do so.

- Hazardous chemicals should be mixed in a separate room suitably equipped for this purpose, by personnel who are fully protected for the work to be carried out.

Handling precautions.

- It is of great importance to apply the safety instructions of any hazard material. You must wear protective coverallsresistance to chemicals, safety shoesresistance to chemicals, and respiratory protection of proper type (for organic vapour and toxic particles), eye protection and proper type of impervious gloves.
- Avoid splashes, smoking eating and drinking before decontamination or proper washing.
- Change coveralls on daily basis.
- Wash before leaving site.

14.6.6.1 Emergency procedures:

- According to Material Safety Data Sheets (MSDS) associated with hazardous material when supplied to PEROJET Company.

- MATERIAL SAFETY DATA SHEET (MSDS) should be available for every chemical in use.
- This data sheet should specify detail procedures to be followed in an emergency, including.
- Whether access to the contaminated area should be prevented.
- The necessity for using protective clothing.
- Disposal procedures.
- Protection of drains and other local services.
- First Aid treatment

14.6.6.2 Long term improvements:

- Steps should be taken to eliminate mixing by attempting to buy chemicals ready mixed. Alternatively, component chemicals may be purchased in a safer form, e.g. solid rather

than liquid, eliminating splashing, or in pellet form rather than as a powder, reducing levels of airborne dust.

14.6.7 . EXTERNAL BODY PROTECTION:

- According to Material Safety Data Sheets (MSDS) associated with hazardous material when supplied to PEROJET Company.

14.6.7.1 Body protection:

- According to Material Safety Data Sheets (MSDS) associated with hazardous material when supplied to PEROJET Company.

In addition and limited to the following:-

- A chemical suit offers the most complete form of body protection for handling very hazardous chemicals. It should have in-built boots, gloves and hood.

- If separate boots are used, these must be made of plastic or synthetic rubber as leather may crack allowing liquids into contact with the skin.

- If separate gloves are used, these should be of the gauntlet type so that the wrists are fully protected, unless there are particularly good wrist seals on the suit.

- The permeability and chemical resistance of gloves and boots should be checked out before using them when handling particular chemicals.

- Chemical suits, boots and gloves should be thoroughly hosed down before any attempt is made to remove them.

- If contact occurs between a corrosive chemical and the skin, the affected areas should be flushed with copious quantities of water and first aid sought.

14.6.7.2 Eye and face protection:

- The main types of eye protection are spectacles, goggles, visors or face shields, space like helmets with in-built face shields.

- Spectacles and goggles designed as suitable for general use are unlikely to meet the requirements for handling chemicals since these only protect against impact and possibly airborne grit.

- Protection is required against chemical splashes, chemical dusts and, possibly gases and vapours.

- Close fitting goggles, which comply with an internationally recognized standard, should be used for work with chemicals e.g. British standards institute BS 2092 D for chemical dusts, BS 2092 c for chemical liquids, and BS 2092 g for adequate protection for the eyes. If these are used, approved goggles should be worn under them to afford the correct level of eye protection.

- Contact lenses should not be worn for work with chemicals, except under approved goggles.

14.6.8. PROTECTION FROM SKIN CONTACT, INQESTION AND NHALAION

According to Material Safety Data Sheets (MSDS) associated with hazardous material when supplied to PEROJET Company.

14.6.8.1 Protection from Skin Contact:

- The skin should always be protected from chemicals, even when there id no obvious danger, e.g. from oils or solvents.

- Protection can take the form of chemical suits, gloves or barrier creams regular washing also helps.

- Coveralls saturated in chemicals or oils should be removed and laundered, as there is virtually constant contact between the substance and the skin.

14.6.8.2 Protection from ingestion:

- Swallowing any industrial chemical is likely to lead to irritation and illness and all possible steps should be taken to avoid doing so.

- Food and drinks should not be consumed in any area where chemicals are handled or stored.

- If a chemical is accidentally swallowed the mouth should be rinsed several time with water, 3 or 4 glasses of milk or water swallowed unless the manufacturer's instructions state otherwise.

- Vomiting should not be induced, unless the manufacturer's instruction says so.

- In areas where poisonous substances are used, antidotes should be readily accessible and all personnel should be instructed on where to find and how to use them.

- Medical attention should always be sought if any chemical substance is accidentally ingested in case there are long-term effects, which need to be dealt with.

14.6.8.3 Protection from inhalation:

- All chemical fumes, gases, vapours and dusts should be treated as harmful.

- Many fine particle dusts are invisible but can be hazardous if inhaled into the lungs.

- Fabric-type dust masks are only suitable for large particle dust e.g. prelates, but offer very little protection against restorable dust.

- Dust respirators provide protection from fine particle dust but only if high irradiancy filters are used.

- Cartridge gas- and vapour filters depend for their efficiency on using the correct absorbent or combination of absorbents.

- There is no indication of the remaining capacity of a respirator or of the point when failure will occur.

- In situations with a high level of contamination, or where the atmosphere may be deficient in oxygen, positive pressure breathing apparatus should always be used.

15. Paints, Coating &Sand Blasting

PJ - HSEMSP 4.6.6.18

15.1 Purpose.

Defining the operations and operational activities which have Significant Impact on the Environment and/or High Occupational Risk.

15.2 Scope.

Paints, coatings and sand blasting are operational activities which affect the OHS.

15.3 References.

3.1: ISO 14001:2004
3.2: OHSAS 18001:2007
3.٣: Law 4/1994 for environment
3.٤: Law 12/2003.

15.4 Definitions.

None

15.5 Procedure and Responsibilities

15.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSE and issue the instructions concerning it.

15.5.2 The concerned Departments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks/ Environmental Impact.

15.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

15.5.4 Making sure that the work locations provide the HSE correct conditions and that operations of starting and finishing operating as well as the contingency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

15.5.5 As for operations of obvious Occupational Risk and the employees should be qualified and trained to execute it, according to the operating Work Instruction.

15.5.6 Suppliers and contractors should be notified by the procedures and requirements of PETROJETHSE System related to their dealings with the company, within the description clarified in the supply order.

15.5.7 Monitoring and measuring operations which affects the HSE, according to the HSE Monitoring and Measurements Procedure.

15.5.8 The HSE Manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSE obligations and other requirements.

15.5.9 All the machines and equipments in the company are subject to Periodic Preventive Maintenance.

15.6.0 Paints, Coating and Sand Blasting

15.6.1 PURPOSE

The purpose of this HSE document is to provide a consistent and effective guideline on the associated hazards and precautionary measures related to paints, coatings and sand blasting.

15.6.2 SCOPE

This Safe Instructions is applicable to all situations where PETROJET HSE General Department is responsible for the implementation of a Safety Management System on Projects

15.6.3 RESPONSIBILITY

The Line Management of each Site/Unit is responsible for its authorization and implementation

The Site/Unit HSE Representatives are responsible for monitoring and auditing the compliance with these requirements in addition to constant review and updating of this document as and when required.

15.6.4 APPROACH.

15.6.4.1 Paints, Coatings and Sand Blasting.

In addition to the usual hazard associated with construction activities, workmen engaged in surface preparation and paint application can be exposed to the dangers of fire, explosion, chemical burns, toxic fumes, dust, and insufficient air. This section of the manual discusses these hazards and how to minimize them.

15.6.4.2 Flammability Hazards of Coating Materials:

15.6.4.2.1 Flammable Materials.

In paint systems, it is normally the organic solvent vapour that is flammable. In PETROJET paint system, all the solvents (except for the water-based paints) present a fire hazard

15.6.4.2.2 Flash Point (Definition).

The flash point is defined as the lowest temperature at which a liquid will give off sufficient vapourto ignite when exposed to an open flame. For most point solvents in PETROJET system, the flash point is less than the normal ambient temperatures in Egypt. The danger of fire exists virtually always when solvents are in use.

15.6.4.2.3 Flammable (Explosive) Limits (Definition).

The lower and upper flammable (explosive) limits define the range of vapour /air concentration that are potentially explosive. The lower flammable (explosive) limit (LEL) is typically on the order of 1% to 2% by volume, a level readily obtained in the area near opened solvent containers and near the nozzle of a spray painting gun in operation.

15.6.4.2.4 Fire Precautions.

Solvents in paints constitute a significant fire and explosion hazard when in the presence of ignition sources. No painting should be carried out within 75 feet of potential ignition sources, e.g., welding, flame-cutting, smoking areas, or sparking tools, unless conditions warrant greater clearance.

Ventilation equipment should be used to maintain a maximum level of solvent concentration, typically below 10% of the LEL.

All electrical lighting and equipment shall be explosion-proof when required in area where solvent vapors are likely to be present.

All electrical equipment such as switches, panel boards, electrical motors and associated equipment must be de-energized before spray painting to eliminate explosion hazards.

Solvents and solvent based paints shall not be applied to surfaces exceeding Egypt summer time ambient temperature. Such items should be suitably marked with the appropriate warning signs. Flammable paints should be kept in a special building or in a sun shelter.

Fire extinguishers should be located at the work area and the area loss Prevention Representative/Fire Chief shall agree upon their suitability.

Work areas should be kept as clean as practicably possible.

15.6.4.3 Health hazards Associated With Paints.

Many paint ingredients are harmful to humans; most people can withstand these materials over a short time and in small quantities. However, some people are immediately sensitive to some ingredients and almost everyone will be affected to some degree if exposed for sufficient time.

There are two major groups of irritants: toxic materials and dermatitis materials or skin irritating materials.

15.6.4.3.1 Toxic Materials.

The most abundant toxic materials found in paints and coatings are solvents. Other toxic materials in paints include pigments (lead), binders (epoxies,.Polyesters) and additives (organotin). Also, dust from cleaning operations or application of the paint can generate toxic materials. These toxic materials can inter the body through breathing, ingestion or skin absorption. Most solvents are toxic to some degree depending on exposure. The degree of toxicity can be measured by the Permissible Exposure Limit (PEL) expressed as Parts Per Million (PPM) or Milligrams of particulate per cubic meter (mg/m3) of solvent in air over an exposure of 8 hours a day five days a week with no ill effects.

15.6.4.3.2 Dermatitic Materials.

Dermatitic materials irritate the skin which, if left untreated, can cause infections or ulceration.

Solvents have a tendency to dissolve and remove natural oils and fats form skin. Certain binders such as epoxy resins may also irritate the skin.

Other chemicals used in paint related work should be handled with care (e.g. paint removers, acid and alkaline cleaners).

15.6.4.3.3 Prevention of Health Hazards.

Many solvents and coatings contain hazardous ingredients. A copy of the appropriate Material Safety Data Sheet (MSDS) should obtained for all materials used, studied carefully, and the required safety precautions implemented.

The following precautions should minimize health hazards:

Identify and seal all toxic and dermatitic materials when not in use

Adequately ventilate all painting areas and provide approved type respiratory protection where necessary. All workmen spray painting shall wear chemical cartridge respirators or airline hoods depending upon the hazards of the paint.

Minimize dust during surface preparation, and dispose of coating residue accordance with the recommendations of Environmental Protection Law No. 4 for the year 1994.

Wear The appropriate personnel protective equipment for the work being carried out.

Avoid touching any part of the body and wear protective equipment (e.g. gloves, disposal suits etc.) when handling dermatitic materials. Personnel involved in painting shall wash thoroughly before eating and at the end of the day.

Use ventilation control or respirators when working with paint removers containing toxic solvents.

15.6.4.4 Ventilation in Confined Spaces.

A supply of clean air is a necessity for all operations involving the application of coating materials, and the paint curing/drying process. A high quality air supply is also required for life support (refer to Safety Manual Breathing Apparatus).

Ventilation is a necessity when painting in confined areas because solvents tend to be heavier than air and migrate to lower levels. The fresh air inlet of the ventilation system should be located near the top of the confined space, and the discharge should be located near the bottom, positioned to eliminate dear air spaces. Supplementary fans may be necessary to ensure good air circulation.

Natural ventilation through open man ways, etc. is rarely sufficient to keep local vapour concentrations to a safe level in terms of PELs or LELs. As a general rule, forced ventilation shall be used, especially in small enclosures and always during spray painting.

Ventilation requirements are proportionally greater for vessels with a capacity smaller than 1580 m3 (10,000 BBL’s or 56,000 cu ft). The recommended ventilation requirements for various vessel capacities are shown in the table below.

Ventilating to 10% of the LEL considerably reduces the likelihood of fire or explosion; however, this level will no doubt exceed the Permissible Exposure Limits for toxic materials. Hence, supplied air respiratory protection is required in confined spaces.

The dusts; fume, gas and vapor content; Air temperature. Air required for breathing apparatus shall meet the recognized standards.

15.6.4.5 Personal Protective Equipment.

Personal protective equipment is required for the majority of operations that involve surface preparation or paint application. The amount and type of personal protection depends on the work being carried out and the location. The below table gives a summary of essential personal protective equipment that must be worn by personnel carrying out specific duties. In addition, all personnel on PETROJET facilities and potentially hazardous areas must wear safety shoes, a hard safety gat and safety spectacles. Other protective details such as gloves, face shields, overalls and hearing protection should be addressed to the HSE Department.

15.6.4.6 Paint Application.

There are numerous hazards associated with paint application and this section is concerned with air and airless spraying, together with brush and roller painting.

15.6.4.6.1 Paint Materials

The majority of paint solvents, many pigments and some binders are toxic in addition to having potential dermatitic hazards. Refer to the Material Safety Data Sheet (MSDS) for information concerning the hazards associated with their use.

In that, solvent based painting materials also present a fire and explosion hazards, painting shall not be carried out near an ignition source. Also additional care should be taken to provide adequate ventilation in confined spaces.

Spraying paint using air or airless systems can be very hazardous and should only be used by trained operators.

15.6.4.6.2 General Safety in Paint Application.

All personnel involved with the application of paint to surfaces should wear the appropriate personal protective equipment for the work being carried out at a given location. For some paint jobs personal protective equipment may have to exceed the normal requirements due to the natured of the work being performed. Some examples of these jobs are above ground and water operations, use of special paints, etc.

All pressurized equipment should be handled carefully. Operators and their assistants should know how to operate and de-energize the equipment in accordance to manufacturer's recommendations.

No spray gun should be pointed at anyone or part of the user's body.

The spray painting operation should be conducted from the upwind side of the object being coated, wherever practicable.

Before using airless spray equipment, all guards recommended by the manufacturer shall be in place and the system shall be in good order and correctly grounded to prevent static build-up.

Prompt professional medical aid shall be available to any person receiving paint injuries.

Hardboard fence or equivalent to protect outside personnel from paint over spray should enclose the area around spray painting activity.

15.6.4.7 General Safety for Paints and Coatings.

Safety precautions concerning various stages of paints and coating are mentioned under their respective sub-headings of this section. This section is provided to highlight areas of paints and coating operations not covered under an individual sub-heading.

Colours reserved for safety use within PETROJET are red. Green, yellow and black, orange and blue. Some equipment identified by colour coding that may be required by painters includes:

Fire Protection : Red

Exit Signs& Emergency Stops : Red

Safety equipment and instructions (eye wash, showers and first aid).
: Green/White.

Hazards (physical and radioactive) & Caution Signs
: Black/Yellow

- Breathing Air Before breathing air used for respiration purposes, it must be checked to ensure it meets the quality requirements referenced in this Manual. Once compressors providing air have conformed to the requirements of Safety manual, they shall be re-tested every quarter to ensure that air quality remains satisfactory.
- Personal Protective Equipment Depending on the work being carried out and its location, appropriate personal protective equipment must be worn that meets both the manufactures requirements and those of PETROJET protective equipment shall be in good condition.
- Blast cleaning Abrasive blast cleaning equipment and abrasive materials shall be suitable for the work to be carried out; substandard products will be in good condition.

- Signs and Barricades Areas where hazardous work is being carried out (such as abrasive blast cleaning and airless spraying shall be suitably barricaded to keep personnel out of the hazardous area, or the timing of the work shall be such that only the work crew doing the job is present at the site, or a lookout is posted around the site. Warning signs shall be posted in hazardous areas with suitable warnings of the potential dangers (i.e. “No entry, sand blasting in progress”).
- Paints and Solvents the amount of paints and solvents stored at the site shall be restricted to a day’s requirements. Bulk storage of paints and solvents shall be in a designated, well marked safe area away from the work area and protected from the sun’s heat.
- Work Permits: The PETROJET work system shall always be used where necessary for all aspects of paints and coatings.
- Equipment Before any equipment is used, operators and assistants shall be trained on the equipment’s use and operation. Also, the equipment shall be in good working order, have an automatic shut-off system and all safety guards installed.
- Personal Health Personnel involved with using paints, solvents and cleaning equipment (i.e., sand blasting) shall be in good health and have medical examinations by professional medical staff at least every two years
- Assistants: No one shall work alone in hazardous areas. An assistant shall always be available or the “buddy” system used.

15.6.5. Hazardous Material& Precautionary Measures

A. Description

- This is a mixture of different solvents as Xylene, Toluene and additives..
- This chemical is being used in thinning primer coatings and certain cleaning operations.

B. Hazard identification

- It is flammable and harmful.
- The thinner and its vapour, causes irritation of eyes and skin. Inhalation of the vapour may irritate the nose and throat. Higher concentration causes headache. Prolonged exposure may cause damage of liver.

C. Handling precautions.

- It is of great importance to apply the safety instructions of thinner. You must wear protective coveralls, safety shoes, respiratory protection of proper type (for organic vapour and toxic particles), eye protection and proper type of impervious gloves.

- Avoid splashes, smoking eating and drinking before decontamination or proper washing.
- Change coveralls on daily basis.
- Wash before leaving site.

D. Medical 1st. Aid.

General

- Report any medical problems including minor irritation to skin and eyes to the clinic for obtaining first Aid treatment.

Skin injuries

- If there are any splashes on skin. Remove all contaminated clothes. Flush affected area immediately with soap and plenty of water, don't attempt to remove any adhered enamel and cover with sterile dressing and seek medical attention

Eye injuries

- In case of eye injury, flush with plenty of water for ten (10) minutes. Don't attempt to remove any adhered enamel, cover with a sterile dressing and seek medical attention immediately.

Inhalation

- Remove immediately any injured person to fresh air area and seek medical attention immediately.

E. Fire fighting

Extinguishing media: foam, dry powder, carbon dioxide.

N.b.water is not suitable for fighting such fires.

F. Storage

- Store in a cold, dry, well ventilated area away from heat, flames and sparks.
- Keep containers closed when not in use.

G. Fire fighting

- Empty containers may retain some residual material. Therefore, you should avoid welding, cutting by hot flames or grinding discs, however, it should be fully emptied and ventilated before use or when attempting cold cutting.
- Washing of the containers will not make safe for food, water or their human use.

16. Pressure Testing

PJ - HSEMSP 4.6.6.10

16.1 Purpose.

Defining the operations and operational activities which have Significant Impact on the High Occupational Risk, and the followed methods to control it.

16.2 Scope.

Pressure Testingis one of the operational activities/ aspects which affect the HSE.

16.3 References.

3.1: ISO 14001
3.2: OHSAS 18001
3.3: Law 4/1994 for environment
3.4: Law 12/2003.
3.5:Guidance Note No. GS 4, Safety in Pressure Testing – HSE, U.K.

16.4 Definitions.

None

16.5 Responsibilities

16.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSE and issue the instructions concerning it.

16.5.2 The concerned Departments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks.

16.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

16.5.4 Making sure that the work locations provide the HSE correct conditions and that operations of starting and finishing operating as well as the contingency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

16.5.5 As for operations of obvious Occupational Risk the employees should be qualified and trained to execute it, according to the operating Work Instruction.

16.5.6 Suppliers and contractors should be notified by the procedures and requirements of PETROJETHSE System related to their dealings with the company, within the description clarified in the supply order.

16.5.7 Monitoring and measuring operations which affects the HSE, according to the HSE Monitoring and Measurements Procedure.

16.5.8 The HSE Manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSE obligations and other requirements.

16.5.9 All the machines and equipments in the company are subject to Periodic Preventive Maintenance.

16.6 Pressure Testing

16.6.1 PURPOSE

The purpose of this instruction is to provide a safe working environment and to protect persons and plant/equipment whenever pressure testing is being performed.

16.6.2 SCOPE

This instruction is applicable to all situations where the H.S.E Management Team is responsible for the implementation of a Safety Management System at the site.

16.6.3 RESPONSIBILITIES

The Construction Management is responsible for its authorization and implementation, in liaison with the Client.

16.6.4 APPROACH

Pressure testing of equipment and piping systems may be required by any combination of the following:

- Governmental mandate, such as OSHA or Industrial Safety regulations
- ASME code for boilers and pressure vessels
- ANSI code for pressure piping covering industrial, nuclear, and power piping
- Section 8.0: for the PRESSURE TESTING (BS 8010: Section 2.8: 1992)
- Customer specifications and related standards
- Petrojet requirements

The purpose of pressure testing is to demonstrate the integrity of the system being tested. By the same taken, there is always the possibility that the test may demonstrate a lack of integrity in the system. This may show up as a repairable leak, or in extreme cases, as a catastrophic failure of some part of the system.

There must always be two means of identifying the test pressure either 2 certified gauges, or 1 certified gauge and 1 certified 'clock' recorder since a faulty gauge could lead to either a sub-standard or an over-stressed situation.

16.6.4.1 Hazards

The possibility of a major failure during a pressure test introduces potential hazards to personnel and property that must be carefully considered in planning and executing the test. These hazards vary in degree depending on the stored energy of the system at the test conditions, and on the extent of the failure. The stored energy at test conditions for a pneumatic test is many times greater than for a hydrostatic test on the same system. This makes much more significant the potential hazards during a pneumatic test from the following four principal effects of a major failure.

- The blast effect of the high-intensity pressure wave created by a sudden rupture in the system
- The destructive effect of parts, such as valves, nozzles, sections of pipe, and the like, becoming high-velocity missiles.
- The destructive effect due to high reaction forces at the point of rupture causing structural support failure and pipe-whip.
- The destructive effect of the emergent jet from the point of rupture.

The first three effects, above, are primarily dependent on the intensity of the failure, the fourth on its duration, which, in turn, is influenced by the volume of the system under test. The first three effects are the most devastating.

16.6.4.2 Test Medium

Pressure testing may be carried out:

- Hydraulically, using liquid (usually water) as the test medium, or
- Pneumatically, using gas (usually air or nitrogen) as the test medium

Note: At pressure ranges most frequently encountered, the amount of energy contained in air is more than 200 times the energy contained in water at the same pressure and volume. For this reason, hydraulic pressure testing is the preferred method and should be used wherever practicable.

Caution: Pressure testing using gas or air is potentially dangerous and should only be carried out in circumstances where use of this method is unavoidable.

The timing and duration shall be fully discussed between the Project Site Management and the Client to compile a detailed plan prior to any work commencing, Method Statements will be produced and strictly adhered to.

16.6.4.3 Test Methods

Pressure tests can basically be divided into two classes:

- Over Pressure Testing: These are tests carried out at pressures exceeding the designed safe working pressure with the object of proving the mechanical strength and integrity of the vessel / system.

- Leak Tests: These tests are normally carried out at or below normal working pressures and are intended to detect leaks at such places as riveted or bolted joints, welded or at defects in the material itself.

16.6.4.4 Precautions

16.6.4.4.1 Hydraulic Pressure Testing

Only experienced competent supervisors able to demonstrate ability shall be engaged in testing activities.

Ensure that the pipe/vessel and its location are capable of withstanding the weight of liquid required for hydraulic tests. Also ensure that the liquid used during the test will not contaminate the interior of the vessel. All temporary support to be removed.

Ensure Blanking off equipment i.e. plugs and blinds are of the same specification as the equipment/system, which is to be tested.

Note: Plugs and Blinds must be correctly marked prior to installing to prevent any mishaps.

The vessel/system being tested must be properly vented to exclude any possibility of air pockets.

Steps should be taken to ensure that blanking-off devices and such items as screwed plugs or connections are not liable to be ejected during testing e.g. as the result of thread failure.

A pipe/vessel should not be subjected to any form of shock loading such as hammer testing while undergoing a full over-pressure test.

A pipe/vessel subjected to a maximum test pressure should not normally be approached for close examination until after a reasonable period of time has elapsed.

Special consideration should be given to safety of personnel in the case of vessels subject to high pressures where the contained energy is high.

All hydraulic testing must be treated with caution and all test areas must be cordoned off and notice boards showing the Test Pressure must be displayed throughout the whole of the Test Area.

During High Pressure testing only personnel involved with the test and Safety Personnel are allowed to be in the test areas.

Note: If leaks occur during the test, the pressure must be released prior to personnel working on the system.

Care should be taken not to over-stress the pipe/ vessel during test.

In the absence of any appropriate standard or code, the test pressure should be limited to the pressure equivalent to 90% of the yield strength, (proof strength) of the material of construction at test temperature for the weakest part of the vessel.

Where a pressurizing medium other than water is used, care should be taken to recognize any additional hazard associated with the liquid concerned. A leak of a highly flammable liquid for example, could lead to a serious fire. It is also necessary to consider the purity of the testing medium; particularly where complete drainage of the vessel after test may not be possible.

16.6.4.4.2 Precautions for Proof Hydraulic Testing

Where the design pressure for which the strength cannot be satisfactorily calculated, (for example, after fabrication work has been carried out on pipe work etc.) has to be determined, a proof hydraulic test will be necessary. The following precautions are in addition to those recommended for hydraulic pressure testing.

Proof hydraulic testing should be carried out under the direct supervision of a person competent to carry out such a test.

The pressure should be applied gradually and increased by steps until the required test pressure is reached, or until significant yielding occurs. At this stage the pressure should not be further increased.

Note: The onset of yielding should be determined by the use of strain gauges, or a strain indicating coating or other equally suitable means.

16.6.4.4.3 Pneumatic Pressure Testing

Only personnel directly involved shall be allowed in the test area.

Pneumatic testing of vessels constructed of materials liable to brittle fracture under the test conditions should be avoided. Precautions should be taken to prevent local chilling during filling and emptying of the vessel. Attention is drawn to the fact that if the gas pressure from high-pressure storage is let down to that of the vessel under test its temperature will fall. The test arrangement shall be such that the temperature of the gas entering the vessel is not lower than the agreed test temperature.

Attention is also drawn to the possibility of condensation occurring within the vessel.

Before testing, careful inspection of the vessel should be carried out. In the case of pressure vessels, the inspection should include radiographic or other non-destructive testing of welds.

Where practicable, steps should be taken to reduce to a minimum the internal volume of the vessel to be tested. This has the effect of reducing the energy stored in the vessel whilst it is under pressure, hence reducing the consequences in the event of vessel failure. This can often be achieved by placing metal or hardwood cores inside the vessel.

Care should be taken to ensure that the methods used for sealing openings in the vessels under test are adequate.

Where the source of pressure is higher than the test pressure, precaution against over-pressurization of the vessel should be taken by the use of reducing valves, pressure gauges and safety valves of adequate size.

Steps should be taken to ensure that people are not likely to be injured in the event of an explosion. This can be achieved by ensuring that the site is cleared and personnel are adequately protected. Any enclosures should be capable of containing flying materials in the event of vessel failure, and of withstanding the rise in pressure caused by release of the air, steam or gas.

The vessel under test should not be subjected to any form of shock loading such as hammer testing.

The vessel should not be approached for close inspection until after the test pressure has been reduced.

16.6.4.4.4 Leak Testing

Leak testing using air, steam or gas as the test medium may be safely carried out providing the vessel has been subjected to a recent over-pressure hydraulic test at a greater pressure. It is sometimes desirable to carry out a gas leak test before the hydraulic or pneumatic test. A test for this purpose may be applied to a pressure vessel without observing the requirements applying to pneumatic acceptance tests, providing the test pressure does not exceed 10% of the design pressure.

Leak testing is sometimes applied to vessels not designed or intended to be used as pressure vessels for example fuel tanks, radiators, storage tanks and oil drums. Danger may arise because the strength of the vessel has not been proved and may not be known.

Danger of Oxygen deficiency must be fully understood by staff involved.

16.6.4.4.5 Precautions in leak testing of vessels or articles not designed or constructed to contain pressure

There should be no danger where a vessel has previously been subjected to a hydraulic test at pressure in excess of the leak test pressure. This should be done wherever possible.

Leak test pressure should always be kept as low as possible. In the case of tanks or radiators intended to contain liquids, there is nothing to be gained by testing them at pressures more than a few pounds per square inch unless they are going to be subjected in service to a liquid head or pressure greater than this.

Means should be provided to ensure that the intended test pressure is not exceeded. If the source of air is a higher pressure than the test pressure of reducing valve should be fitted together with a safety valve and a pressure gauge on the low-pressure side.

For low pressures of 2 to 5 pounds per square inch (up to 1/3 bar) a lute of adequate area is preferable to a safety valve. (A lute is a device such as a U-tube, which uses a water

leg of appropriate height to maintain the pressure of air; over-pressure will blow the water out and release the pressure).

All articles or vessels should be carefully inspected before being subjected to pneumatic test pressure. In the case of low-pressure leak testing, this inspection should be visual and if necessary should include radiographic or other non-destructive tests.

Steps should be taken to ensure that any openings in the component under test are adequately sealed and that closures are not liable to be blown off under pressure. Bolted flanges or screwed caps should be used wherever possible.

The interior volume of the component under test should be reduced wherever practicable as described under paragraph (3) above 'Pneumatic Pressure Testing.'

16.6.4.4.6 Flexible Tube Connections

During low pressure testing, rubber tubing is sometimes used for connecting the air supply to the article under test. The tube is simply pushed onto a pipe or spigot on the test component without positive clamping. This arrangement cannot be accepted as a means of preventing over-pressure.

Where flexible tubes are used they should be securely fastened at both ends. Tubes whipping when the pressure caused one end to come free have caused accidents and precautions need to be taken to prevent this by securing lines as required.

17. Excavation and Trenching

PJ - HSEMSP 4.4.6.6

17.1 Purpose.

Defining the operations and operational activities which have Significant Impact on the High Occupational Risk, and the followed methods to control it.

17.2 Scope.

Excavation & Trenching Are Operational Activities/ Aspects Which Affect The Hse.

17.3 References.

17.3.1: ISO 14001
17.3.2: OHSAS 18001
17.3.٣: Law 4/1994 for environment
17.3.٤: Law 12/2003.

17.4 Definitions.

None

17.5 Responsibilities

17.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSEand issue the instructions concerning it.

17.5.2 The concerned Departments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks.

17.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

17.5.4 Making sure that the work locations provide the HSEcorrect conditions and that operations of starting and finishing operating as well as the emergency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

17.5.5 As for operations of obvious Occupational Risk, the employees should be qualified and trained to execute it, according to the operating Work Instruction.

17.5.6 Suppliers and contractors should be notified by the proceduresand requirements of PETROJETHSE System related to their dealings with the company, within the description clarified in the supply order.

17.5.7 Monitoring andmeasuring operations which affects the HSE, according to the HSE Monitoring and MeasurementsProcedure.

17.5.8 The HSE Manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSEobligations and other requirements.

17.5.9 All the machines and equipments in the company are subject to Periodic Preventive Maintenance.

17.6 Excavation & Trenching

17.6.1 Introduction

Excavation & trenching safety to protect workers from Excavation hazards (cave-ins)

17.6.2 Scope and application

These rules are applied to all open excavations made in the earth's surface which include trenches.

17.6.3 Definitions

A. Benching	A method of protecting employees form cave-ins by excavating the sides of an excavation to from one or series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels.
B. Cave-in	The separation of a mass of soil or rock materials from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by failing or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person
C. Competent Person	One who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous, or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.
D. Excavation	Any man-made cut, trench, or depression in an earth surface, formed by earth removal.
E. Trench	A narrow excavation below the surface of the ground, less than 15 feet wide, with a depth no greater than the width.
F. Protective System	A method of protecting employees from cave-ins, from material that could fall or roll from an excavation, or from the collapse of adjacent structure. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide necessary protection
G. Shield	A structure that is: capable of withstanding the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can! Be permanent structures or can be designed to be portable and moved along as work progresses.
H. Sloping	A method of protecting workers from cave-ins by excavating to form sides of an excavation those are inclined away FROM the excavation to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences such as soil type, length of exposure, and application of surcharge loads.

17.6.4 . General Requirements

A. The following specific site conditions should be taken into accounts for safe excavations:

- ✓ Traffic
- ✓ Nearness of structure and their conditions
- ✓ Soil
- ✓ Surface and ground water – the water – the water table.
- ✓ Overhead and underground utilities
- ✓ Weather

B. Before any excavation actually begins, the standard requires the employer to determine the estimated location of utility installations: Sewer, telephone, fuel, electric, water lines or any other underground installations that may be encountered during digging

C. No employee should operate a piece of equipment without first being properly trained to handle it and fully alerted to its potential hazards.

D. The standard requires that a competent person inspect, on a daily basis, excavations and the adjacent areas for possible cave-ins, failures of protective systems and equipment, hazardous atmospheres, or other hazardous conditions.

E. Adequate protective systems will be utilized to protect employees. This can be accomplished through sloping, shoring, or shielding.

F. Workers must be supplied with and wear any personal protective equipment that seem necessary to assure their protection.

G. All spoil piles will be stored a minimum of two (2) feet from the sides of the excavation. The spoil pile must not block the safe means of egress.

H. If a trench or excavation is 4 feet or deeper, stairways, ramps, or ladders will be used as a safe means of access and egress. For trenches, the employee must not have to travel any more than 25 feet of lateral travel to reach the stairway, ramp, or ladder.

I. No employee will work in an excavation where water is accumulating unless adequate measures are used to protect the employees.

J. A competent person will inspect all excavations and trenches daily, prior to employee exposure or entry, and after any rainfall, soil change, or any other time needed during the shift. The competent person must take prompt measures to eliminate any and all hazards.

K Excavations and trenches 4 feet or deeper that have the potential for toxic substances or hazardous atmospheres will be tested at least daily. If the atmosphere is inadequate, protective systems will be utilized.

L. If work is in or around traffic, employees must be supplied with and wear orange reflective vests. Signs and barricades must be utilized to ensure the safety of employees, vehicular traffic, and pedestrians.

17.6.5. Soil Classification and Identification

Generally we define soil classifications within the simplified soil classification systems, which consist of four categories:

A. Stable Rock
B. Type A Soil
C. Type B Soil
D. Type C Soil

Stability is greatest in stable rock and decreases through type A and B to type C, which is the least stable.

17.6.6. Soil Test & Identification

Many kinds of equipment and methods are used to determine the type of soil prevailing in an area, as described below:

A. Pocket Penetrometer

Penetromenters are direct reading, reading, spring – operated instruments used to determine the unconfined compressive strength of saturated cohesive soils. Once pushed into the soil, an indicator sleeve displays the reading.

B- Visual Test:

If the excavated soil is in clumps, it is cohesive. If it breaks up easily, not staying in clumps, it is granular.

C. Thumb Penetration Test

The thumb penetration procedure involves an attempt to press the thumb firmly into the soil in question. If the thumb makes an indentation in the soil on with great difficulty, the soil is probably type A. If the thumb penetrates no further than the length of the thumb nail, it is probably Type B soil, and if the thumb penetrates the full length of the thumb it is type C.

D- Dry Strength Test:

Try to crumble the sample in your hands with your fingers. If it crumbles into grains, it is granular. Clay will not crumble into grains, only into smaller chunks.

E. Wet Manual Test:

Wet your fingers and work the soil between them. Clay is a slick paste when wet, meaning it is cohesive. If the clump falls apart in grains, it is granular;

17.6.7 Excavation Protection Systems

There are three basic protective systems for an excavation and trenches:'

A. Sloping and Benching Systems

B. Shoring Systems (Hydraulic Shoring - Pneumatic Shoring**)**

C. Shielding Systems (Trench Boxes Combined Use)

18. Security

PJ - HSEMSP 4.4.6.1

18.1 Purpose.

Defining the operations and operational activities which have High Occupational Risk, and the followed methods to control it.

18.2 Scope.

Security & Access Control Are Operational Activities/ Aspects Which Affect The HSE

18.3 References.

18.3.1: ISO 14001
18.3.2: OHSAS 18001
18.3.4: Law 4/1994 for environment
18.3.5: Law 12/2003.

18.4 Definitions.

None

18.5 Procedure and Responsibilities

It is a requirement of Petrojet Security Policy that the Company develops access control Safe Instructions and physical security measures appropriate to the needs of its activities because effective control of access is the first line of defense to prevent unauthorized persons achieving entry into Company sites or other facilities.

The Security Manager must ensure that suitable access control Safe Instructions and physical security measures are in place and correctly applied. This Safe Instructions provides a framework on which individual Safe Instructions can be based, the factors that should be considered and provides background technical information.

18.5.5.1 Vehicle Access and Parking Arrangements

Where possible, vehicle access should be controlled using a manned barrier or speed restriction device located on the site perimeter. Ideally there should be separate access routes for private and goods vehicles.

A holding area to stop and check vehicles may be installed if required, although it is important to ensure that the flow of traffic on public roads is not hindered.

Ideally, visitors and goods vehicles should be booked in and then directed to their specific parking or unloading areas, which should be clearly identified.

Consideration should be given to allocating a separate access controlled parking area for employees vehicles with vehicle passes displayed. The Safe Instructions for the use and control of these vehicle passes should be issued. The design should be such that they are not easily identified as being Petrojet permits and should be changed periodically to more easily identify non-valid passes.

In most circumstances off-site parking of private vehicles is the more secure arrangement as far as the collective safety of the staff is concerned.

No-Parking areas should be clearly marked and vehicles should not obstruct emergency access routes or facilities. It is recommended that no unattended vehicles are parked within a specified distance of Company buildings or installations, typically this could be 9 meters.

18.5.2 Out of Hours Access

Safe Instructions to control out of hours access to Petrojet HSE Department facilities should be considered in order to ensure personnel on site and especially cleaners, visitors, maintenance and temporary staff are supervised. The site and buildings must be secured on their departure.
Where appropriate security personnel should be warned beforehand of any person who may be on site out of hours.

18.5.3 Entry to Secure Areas

This sub-section applies specifically to areas where cash and sensitive data are held, access to which should be strictly controlled to allow personnel access on a "need to enter" basis only. Health and Safety procedures must also be implemented at all times. Access where possible should be restricted to one manned entrance with appropriate automatic controls, if possible.
A separate instruction should be written for each secure area in order to reduce any opportunity to interfere with equipment, cash or information.
There should be no wedging of access doors for ventilation purposes. All office doors within a secure area should be kept locked when they are unoccupied. A clear desk policy should be applied.
As a general rule, visitors and contractors should not be allowed access. However, it may be necessary to allow contractors access for maintenance and cleaning purposes. They should be supervised at all times. If they are giving technical assistance, the escort should have specialist knowledge of the work and equipment involved.
All secure areas should be checked that they are unoccupied and are secured at the end of the day's activities.

18.5.4 Access Records

It is sensible practice to be able to identify who and what vehicle is on site at any given moment, especially if an emergency evacuation of the site is required.

19. Tools – Equipment – Portable Ladders, Mobile Equipment

PJ HSEMSP4.4.6.8

19.1 Purpose.

Defining the operations and operational activities which have Significant Impact on the Environment and/or High Occupational Risk.

19.2 Scope.

Tools-Equipment-Portable Ladders, Mobile Equipment, Over Head Cranes, And Hoist – Operations Are Operational Activities/ Aspects Which Affect The Hse.

19.3 References.

19.3.1: ISO 14001
19.3.2: OHSAS 18001
19.3.3: Law 4/1994 for environment
19.3.4: Law 12/2003.

19.4 Definitions.

None

19.5 Responsibilities

19.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSEand issue the instructions concerning it.

19.5.2 The concernedDepartments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks HSE.

19.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

19.5.4 Making sure that the work locations provide the HSE correct conditions and that operations of starting and finishing operating as well as the contingency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

19.5.5 As for operations of obvious Occupational Risk, the employees should be qualified and trained to execute it, according to the operating Work Instruction.

19.5.6 Suppliers and contractors should be notified by the procedures and requirements of PETROJET HSE System related to their dealings with the company, within the description clarified in the supply order.

19.5.7 Monitoring andmeasuring operations which affects the HSE, according to the HSE Monitoring and Measurements Procedure.

19.5.8 The HSE Manager will keep a file of controlling the operations affecting HSE System including Monitoring and Measuring Results Record, HSEobligations and other requirements.

19.5.9 All the machines and equipments in the company are subject to Periodic Preventive Maintenance.

19.6 Tools-Equipment-Portable Ladders ,Mobile Equipment, Over Head Cranes, Hoist Operations

19.6.1.0- Tools and equipment:

Accidents that happen with tools and equipment are caused by persons who use the wrong tool for the job, use tools in poor condition, use tools in the wrong way or fail to properly store and maintain tools.

19.6.2.0 OPERATING MACHINES:

1-Machines are to be operated only by qualified and authorized personnel. Know the capacities of the machine.

2-Machines shall not be started unless the guards are in place and in good condition.

3-Whenever guards or safety devices are removed to make repairs or adjustments or to service equipment, the power for the equipment shall be turned off and the main switch locked and tagged in the off position.

4- A chuck or face plate shall never be put on a lathe by power operation

5- Tools shall never be left so that they may creep, be thrown or fall when machine is started.

6-The operator shall not rely on his hands to prevent material from turning with the cutting tool.

7- Pedestal grinders shall have tool rests adjusted to within 1/8” from the grinding wheel before use. The adjustable tongue guard be ¼” from grinding wheel

8- Use a brush, special tool or hook to remove chips, shavings or other material from work.. Keep fingers clear of point of operation.

9- The transparent guards shall be kept clean.

10-Never reach through or over a machine so that cutters or revolving parts come in contact with your body or clothing. Avoid wearing anything that may become entangled in moving parts.

11- Stand to one side-never directly in line- with the work being fed through machines such as circular saws, punches, presses and shears

19.6.2.1- ELECTRICAL EQUIPMENT:

1-Electric power, hand- held, operated tool shall be grounded or be of the approved double-insulated type. All 110v- 220v electric powered hand – held tools and equipment must be protected by the use of approved ground fault circuit interrupters, or there shall be assured equipment grounding conductor program.

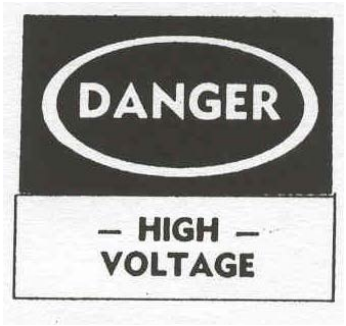
Tools – Equipment – Portable Ladders, Mobile Equipment

2-Make no repairs to electric tools. Do not tape cords. Return defective toolsto tool storage area for repairs and identify as “out of order” .Only authorized electricians are allowed to make electrical repairs, alterations and installations.

3- Protect electric cords and air hoses to prevent damage and from becomingstumbling hazards.

4- Electrical tools shall not be used when standing on a wet surface. Doing so can cause a serious electric shock.

5- Never yank out an electric cord; pull the plug.



6- Treat low voltage circuits with the same respect as those of higher voltage.

7-Assume that all circuits are live until they have been thoroughly checked and proven to be dead.

8- Observe lock out/tag out instructions before starting to work on electrical equipment, even when changing fuses.

9- Do not depend on rubber gloves or insulated handles of tools to work on “hot lines”

10- Never leave a “hot line” unguarded or not isolated in an area where other workers could contact such a line.

19.6.2.2- ELECTRIC DRILS:

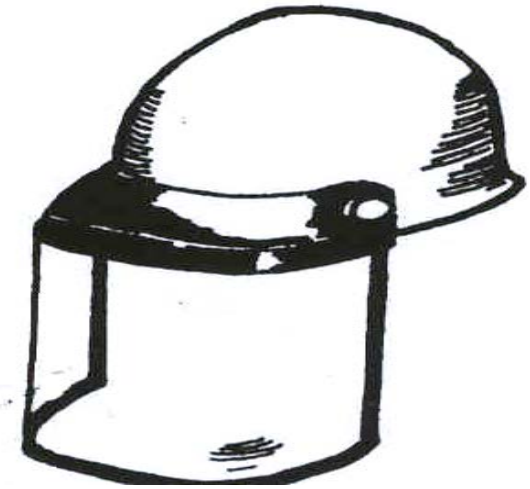
a. -The possibility of a drill breaking is lessened by using a bit no longer than that necessary for the work to be done and by not forcing while drilling.

b. -Large size bits shall not be ground down to fit smaller chucks.

c. - Secure the work to prevent it from whipping. Never hold the work in your hand. Clamp it down.

d. -Use the proper bit designed for the work.

Use face shield



19.6.2.3- PORTABLE GRINDERS:

i. -Grinders shall be equipped with guard when using wheels over 2 inches in diameter. guards shall not be removed or altered except by personnel authorized to service grinders.

ii. -Do not attempt to change a wheel without first getting authorization and adequate instructions. Always be sure to check the speed on the wheel blotter label against the grinder speed for conformity.

iii. -Check to be sure the wheel is properly mounted before starting a grinder. Straight wheels should be mounted between matching safety flanges at least 1/3 the wheel diameter. The nut should be tightened securely, but not an excess which could crack the wheel

iv. - Inspect the grinding wheel (disc or stone) before using. If cracked or chipped, not use.

v. -When first starting a grinder, it shall be held under a bench, against the job or other shielding, and run for about a minute to test it . This will prevent the operator from being struck by pieces of broken wheel should a defect or excess speed cause it to fly apart.

vi. - Cup wheels shall be used on the face only.

vii. - Straight wheels shall be used on the circumference only- never on the sides.

viii. - Banging a grinding wheel against the work will not clean the wheel and may cause the

wheel to break.

ix. - When operating a portable grinder, never force a wheel by using excessive pressure on the grinder.

x. - Handle grinders with care to prevent damage from dropping. If you drop a grinder, take no chances; have it checked before using. Do not handle grinder by the electrical cord or air hose.

xi. - If a wheel seems out of balance (indicated by excessive vibration in the grinder), have the condition checked.

xii. - If you think a grinder is running over speed or is defective in any way, tag it out of service and report it immediately.

xiii. -Always stop the wheel on the work piece before setting the grinder down. When set a grinder down, do not rest it on the wheel.

19.6.2.4- USE OF PORTABLE LADDERS:

Ladders can be one our most hazardous pieces of equipment if they are used improperly. Ladder accidents are caused by carelessness, misuse or defects in the ladder structure.

Follow these rules to assure your safety when using ladders:

i. -Carry a ladder with the front end high enough to clear anyone ahead of you.

ii. - Before you use a ladder, assure that it of an “A” classification, then all rungs, braces, cleats, feet, and rails for possible defects. Tag and remove defective ladders from service. Report defective ladders to your supervisor and don’t use the ladder until repairs have been made by a qualified person.

iii. -Select the right ladder for the job. Never use a ladder that is too short for the job.

iv. - Set up portable ladders using the 1 to 4 rule. The feet of the ladder should be on a non slip or secured against slipping and placed 1 foot from the base of the vertical support for every 4 feet of ladder length between supports.

v. -tie or otherwise attach the ladder securely at the top.

vi. - Never use make-shift ladders.

vii. - When climbing up or down, face the ladder and use both hands (there should be 3 points of ladder contact at all times –2 feet on hand, 2 hands on foot).

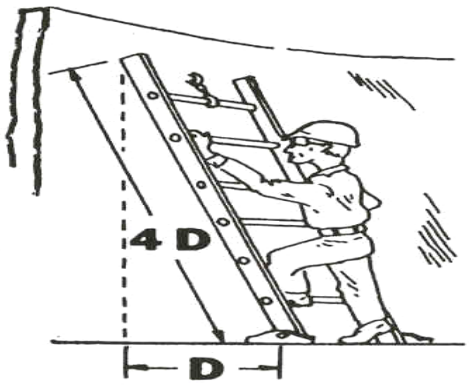
viii. - Keep ladders free of grease, oil, mud, and other slippery materials.

ix. - Do not reach over an arm's length beyond the side rail of a ladder.

x. -Have materials and tools hoisted with a hand line. Don't attempt to carry them when climbing on a ladder.

xi. - Never work higher than the third rung from the top of a ladder unless the ladder is tied off and the worker is tied off.

xii. -When using a ladder for access to a work level, the ladder should extend a minimum of 36 inches above the work level so personnel can transfer from the ladder to the work level. If it is not practical, or the ladder is too short and cannot extend that distance, then a grab rail shall be provided to ease the transfer from the ladder onto the work level.



xiii. - Only use a step ladder in the open and locked position. Follow manufacturer's instructions on usage.

xiv. - Before setting a ladder in front of a door, make certain that the door is locked or barricaded.

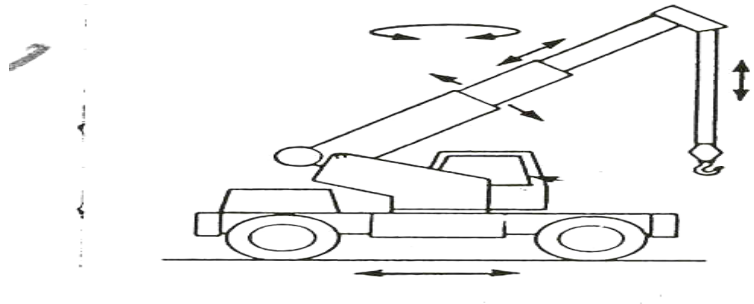
19.6.3 MOBILE EQUIPMENT

i. Only authorized personnel may operate mobile equipment. Any type of moving equipment is hazardous unless it's used properly. When working with such equipment, safe working methods and alertness to hazards are your best protection from accidents.

ii. These rules should be your guidelines. Whenever you have any doubt about the safe way to use equipment, ask your foreman.

iii. Don't get on or off equipment while it is in motion.

iv. Stay clear of moving equipment whenever there is a danger from swinging booms, crane cabs, Suspended loads, etc. When operating a crane with a suspended load, the operator is required to sound a warning to other workers prior to that load being moved into the area containing the workers.



v. No person should be permitted to stand or pass under a suspended load.

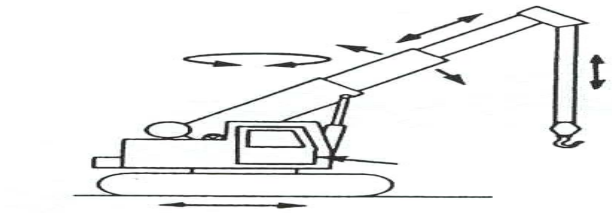
vi. A tag line should be used on all suspended loads.

vii. Accessible areas within the swing radius of the rear of the rotating superstructure of the crane shall be barricaded; this barricade could be on the ground or attached to the crane itself.

viii. Only an approved suspended work platform system is to be used for working from a crane or derrick line. An approved suspended work platform system includes restrictions on the crane or derrick, the load line, the platform, and the personnel in the platform.

ix. No riders are allowed on any moving construction equipment, unless seats are provided by the manufacturer and instructions are followed.

x. Unless special cab protection is provided, the driver must not remain in the cab of a truck when it is loaded from overhead with rocks or heavy material by a shovel, crane or similar equipment.



xi. Do not travel with a suspended load from a crane or winch truck unless load is secured (to prevent swinging).

xii. -All hooks must be moused unless they have a built-in safety latch.

xiii. -Cranes, derricks, and winch trucks must be operated with extreme caution when near power lines. Assume all wires are hot unless you are sure they are not.

xiv. - All power lines must be barricaded or flagged when there is danger of contact by mobile equipment.

xv. - Lines which could be reached accidentally must be de- energized or otherwise made safe before any work is done.

xvi. - Never operate equipment closer than 3m to any power line, but increase the distance for more than 50 kilovolts.

xvii. -No equipment require to work over the top of power lines.

xviii. - Only an appointed signalman may give signals to the operator, except for emergency stop signal.

xix. - Use only standard signals, as shown herein to direct equipment operations.

xx. - The operator's attention shall not be diverted when engaged in operating the crane.

20.Radiographic Testing

PJ - HSEMSP 4.4.6.19

20.1 Purpose.

Defining the operations and operational activities which have Significant Impact on the Environment and/or High Occupational Risk.

20.2 Scope.

Radiographic testing is one of the operational which affect the HSE.

20.3 References.

20.3.1: ISO 14001:2004
20.3.2: OHSAS 18001:2007
20.3.3: Law 4/1994 for environment
20.3.4: Law 12/2003.

20.4 Definitions.

None

20.5 Procedure and Responsibilities

20.5.1 The HSE Manager coordinates with the concerned departments Managers to numerate the operations which affect the HSE and issue the instructions concerning it.

20.5.2 The concerned Departments Division Head will set the detailed Work Instructions to control the different operations which affect the HSE, indicating the necessary precautions in execution in order to avoid the harmful Occupational Risks.

20.5.3 Making sure that activities / different operations are being carried out under the suitable circumstances (specified operating criteria) and which are specified in the operations instructions concerning this activity, and in case of any deviation, the suitable corrective actions should be taken.

20.5.4 Making sure that the work locations provide the HSE correct conditions and that operations of starting and finishing operating as well as the contingency cases are taken into consideration according to the Emergency Preparedness and Response Procedure.

20.5.5 As for operations of obvious Occupational Risk and/orEnvironmental Impact, the employees should be qualified and trained to execute it, according to the operating Work Instruction.

20.5.6 Suppliers and contractors should be notified by the proceduresand requirements of PETROJETHSESystem related to their dealings with the company, within the description clarified in the supply order.

20.5.7 Monitoring andmeasuring operations which affects the HSE, according to the HSE Monitoring and MeasurementsProcedure.

20.5.8 The HSEManager will keep a file of controlling the operations affecting HSESystem including Monitoring and Measuring Results Record, HSEobligations and other requirements.

20.5.9 All the machines and equipments in the company are subject to Periodic Preventive Maintenance.

20.6 Radiographic Testing

20.6.1-Purpose

The purpose of these Safe Instructions is to describe the necessary action to be taken to safe guard its employees and others and to conserve the environment

20.6.2-Scope

This Safe Instructions is established to assure that the safety precautions which deemed necessary to carry out radiographic test has been taken (ir 192 is the used isotope) .

20.6.3- Safe Instructions

20.6.3.1 QA / QC dept. shall notify safety dept. By enough time (three hours minimum)

20.6.3.2 QA\QC dept. Will issue work permit which will include all the necessary caution which includes:

A- Continuous alarm during shooting.

B- Determine the safe area according to the attached figure (radiation level is below 7.5 µ sv /hr.) The area will be determined in cooperation with the Q. C / department.

C- light alarm to be used. (in case of night shift activities).

20.6.3.3 up on determining the supervised area safety staff will start to evacuate all personnel within this area .

20.6.3.4 Radiation level shall be monitored by survey meter in supervised area (radiation level below 7.5 µ sv /hr.).

20.6.3.5 Radiation area (radiation level over 60 µ sv/hr .) Shall be circled by rope or any other mean before starting.

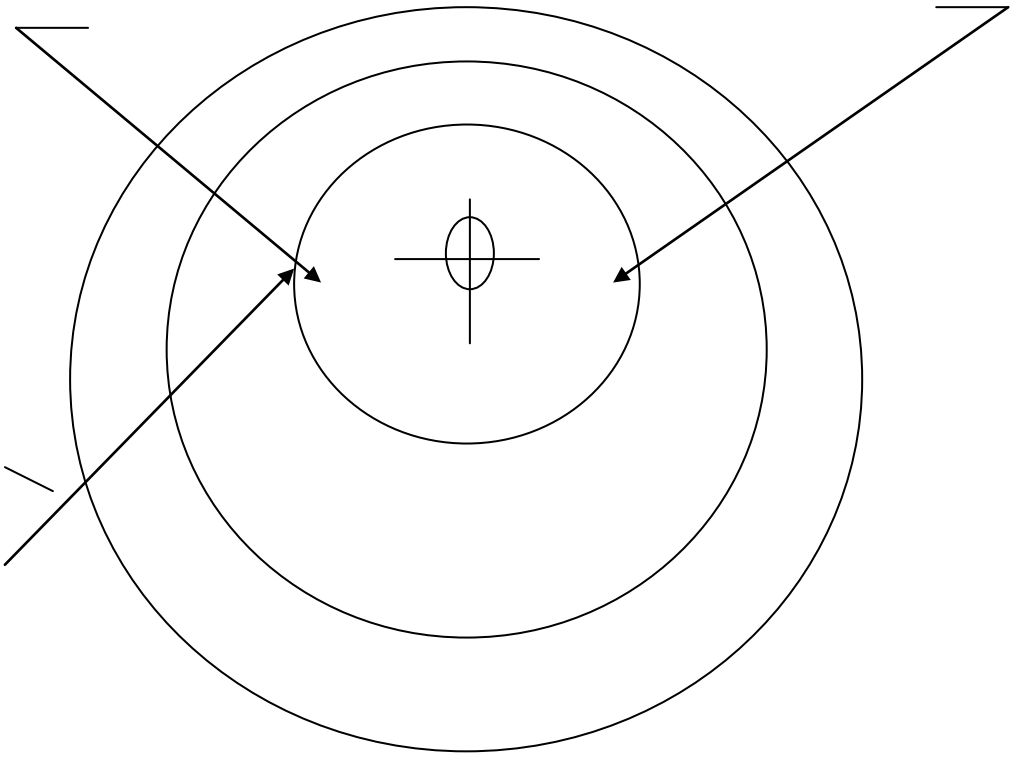
20.6.3.6- Shielding shall be used whenever it is possible{collimator or any other shielding means } to reduce the radiation area and will be taken in consideration when determining the areas of concerns.

20.6.3.7- The continuous alarm shall be stopped at the end of the shooting.

20.6.3.4 -attached:

*diagram illustrates the requirement for site radiography.

Controlled Area (Radiation Level Up To 60 µ Sv / Hr) Radiation Area



Supervised Area (Radiation Level Up To 7.5 µ Sv / Hr)

The Distance Of The A/M Area To Be Determined According to Source Strength, And The Shielding Used.

21.Medical Care and First Aid

PJ - HSEMSP 4.4.6.11

21.1 Purpose.

Defining the operations and operational activities which have Significant Impact on the Environment and/or High Occupational Risk.

21.2 Scope.

Medical Treatment & First Aid are operational activities/ aspects which affect the HSE.

21.3 References.

21.3.1: ISO 14001:2004
21.3.2: OHSAS 18001:2007
21.3.3: Law 4/1994 for environment
21.3.4: Law 12/2003.

21.4 Definitions.

None

21.5 Medical Treatment & First Aid

21.5.1 PURPOSE

The purpose of this Safe Instructions is to provide guidelines for First Aid and Medical

Facilities at the PETROJETHSE Department.

21.5.2 SCOPE

The Safe Instructions is applicable to all situations where the Medical Department Management Team is responsible for the implementation of of this procedure.

21.5.3 RESPONSIBILITIES

The Medical Manager is responsible for its authorization and implementation.

21.5.4 APPROACH

PETROJET shall supply an adequately equipped and sanitary facility for treatment of minor injuries and primary care of seriously injured personnel. A site ambulance is also supplied for transfer purposes to the nearest Hospital, when the need arise.

Supplies stocked and medications kept in these facilities shall be dealt with and recorded, in accordance with the local laws, at the discretion of site Doctor/medical staff.

PETROJET shall provide a qualified Doctor on site. This person shall be responsible for providing first aid and/or emergency treatment.

21.5.5 Medical Treatment

Coordination with the relevant authorities to establish professional medical services such as Doctors, Nurses and Emergency Medical Services (ambulance etc.) for the Projects has taken place and the Names and Phone Numbers of these facilities are available at the Medical Department.

Treatment of injuries on the job site shall only be by Qualified and Competent First Aiders or Site Medical personnel.

Qualified personnel shall not exceed the level of their training in the treatment of job related injuries. On job sites where first aid may be rendered, a First Aid Register shall be maintained, and the Medical Department will hold records of all First Aid Cases. Anyone found not reporting first aid cases to the Clinic, will be liable for disciplinary action. A copy of the First Aid Register Form is attached.

21.5.6 Handling of Injury Cases

When an employee is injured on the job site that professional medical treatment is needed but an ambulance is not required, the Site Supervisor shall ensure the following steps to be taken:

- Have the injured employee taken to the Site Clinic.
- Be sure the injured employee is accompanied to the Clinic by another employee. Preferably known to the employee or the Site HSE Technician.
- The Site Doctor shall make verbal notification of all Injuries and Occupational Health Cases to the Project HSE Manager on the day they occur or on the day of notification of the case. Also, he shall submit a fully report to Project HSE Manager.
- As soon as practical, an accident investigation and preparation of associated reports relating to said Doctor's actions shall be initiated and immediately hand delivered to the Project HSE Manager.

  All supplemental reports should be completed by the Site Doctor upon occurrence of a change of employee's status (e.g., employee returns to work, a no lost time becomes a lost time).
- The Site Doctor shall keep the Project HSE Manager informed at all times.
- Medical treatment weekly report should be submitted to the Project HSE Manager at the end of each Week, copy of which shall also be sent to the Assistant General Manager (Project Fabrication).

  When an employee is injured and that an ambulance is required, the following steps shall be taken:
- Have a person call the site Doctor as per the Emergency Preparedness Plan established at the Project. This person must remain in contact with the Doctor until he fully understands the location of the injured person and the type of injury suspected.
- First aid should be rendered within the restrictions of the qualifications of persons available at the accident site. The injured person should never be moved unless further injury is not possible.
- In cases where additional ambulances are required a person should be sent to the entrance of the project to direct the emergency vehicle, without delay.
- If at all possible, a Medical or HSE Representative should accompany the injured employee in the ambulance.

- The "Injury Treatment Notification Report Form, noted above and notification requirements shall be fully complied with, and by the injured person Supervisor and the Site Doctor.

- **SITE MEDICAL FACILITIES**
  There will be a clinic on site manned all over working hours by a qualified Doctor.
- **ASSOCIATED HSE DOCUMENTS**
  Emergency Preparedness Plan

22.Energy Consumption Reduction

PJ - HSEMSP 4.4.6.22

22.1. Purpose and scope

This instruction describes the actions to be taken to reduce energy (gas and electricity) Consumption, which is one of the organization's environmental improvement objectives. This instruction sets out how energy consumption shall be controlled and monitored.

22.2. Reference:-

ISO 14001 Manual Handbooks

22.3. Responsibility

All staff is responsible for conserving electricity and heat.
The Electrician (OR Engineer OR . . . . . .) is responsible for the ongoing programme of Introducing sensors and other energy saving devices, and for programming the 7-day clock.
The Engineer (OR . . . . . .) is responsible for checking for compressed air leaks.
The Electrician (OR Engineer OR Environmental Manager OR . . . . . .) is responsible for meter readings.
The Environmental Manager (OR . . . . . .) is responsible for analyzing the consumption figures and initiating any necessary corrective action.

22.4. Control of electricity usage

All lights shall be turned off when daylight is sufficient or the room, etc. is not in use.
There is an on-going programme to install sensors in common areas, e.g. reception, corridors, toilets.
All computers shall be programmed to power down/power off VDUs when the computer is idle.
There shall be weekly checks for leaks in the compressed air system. Leaks shall be mended.
The compressor shall be turned off one hour before the end of the working day; the receiver holds sufficient air for operations to continue.

22.5. Control of heating

All central heating is thermostatically controlled. If an area becomes too hot, reduce the thermostat before opening windows. All windows shall be closed when a room is vacated.

23. Management of Change

PJ - HSEMSP 4.4.6.12

23.1 Purpose

- This Management of Change procedure has been developed to assist PETROJET management review and evaluate change.
- The purpose of the procedure is to provide a step by step guide, which ensures that all changes undertaken within PETROJET are fully documented, the impact of the change assessed and appropriate actions taken to ensure Health, Safety, Security, Environment, Engineering, Operations, Business and Commercial issues are not compromised.

23.2 Scope

- The objective of this document is to define PETROJET Company Management of Change (MOC) process used to systematically evaluate, communicate and document changes to the work environment. This MOC process should be used to manage all temporary and permanent changes to organization, personnel, third-party services, process & procedures, systems, equipment, products, and materials or substances to ensure that health, safety, and environmental risks arising from these changes are managed to an acceptable level.

23.3 Definitions

PTJ:

The Petroleum Projects and Technical Consultations Co. PETROJET

Change

- Is the result of a conscious decision to exchange, substitute, convert, alter, add, modify or vary a component of an existing process, its equipment and/or control and management Systems Change can be administrative, organizational and/or technical.

Change in the organization

- Changes to an organization's structure and responsibilities may present a challenge to a company. To accommodate organizational change, management shall utilize the MOC to assess and document the impact of an organizational change. The following are examples of organizational changes.
- Change in the organizational structure of an operation and supporting service group.

- Changes in hours worked.
- Changes in delegation of authority where health, safety or the environment is impacted.
- Changes from company to third party contracted services.

Change to equipment

- Any change to PTJ mechanical equipment, temporary or permanent.
- Changes in hardware or software of technical equipment.
- Change to specification of equipment handling or materials.

Emergency change

- A change implemented outside the normal MOC procedure in order to avoid imminent personal injury, impact on the environment or equipment damage. Without exception, the detailed MOC procedure must subsequently be applied within 48 hrs.

Temporary change

- Change or modification made with the intention of being restored to original configuration or another permanent configuration after a specified period of time. A temporary change must have an identified timing or removal date, which must be established and approved prior to implementation.

Permanent Change

- Any change to personnel, systems, procedures, equipment, materials etc. affecting the original specifications or established recognized industry standards.

Changes to practices and procedures

- Any changes in operating (technical or safe practices) or maintenance practices / procedures.

NOTE:

Care should be taken to ensure that any such changes don't affect the compliance with regulatory requirements.

23.4 Responsibilities

The General Manager (each branch/project/department)

- Is responsible for its authorization and implementation in co-ordination with the HSE Manager for approving and implementing the permanent changes.

Project / Site managers

- The Project Manager has the overall responsibility for ensuring the resources and personnel are available to properly implement this procedure.
- Ensuring the application of all changes on site at area under his responsibility.
- Remove and solve any problems that impeding the implementation of the changes on site.
- Applying all risk controls to ensure that all risks arising from these changes are managed to an acceptable level.
- Coordinate and communicate with all department that affected by this change;

HSE Manager

- Reviewing and approving of the document brief;
- Helping in reviewing the risk assessment and participate in adding any necessary controls measures to ensure all risks arising from these changes are managed to an acceptable level.
- Ensuring that adequate training is provided when necessary.

Document controller:

- Review the final risk assessment and safe working instructions forms and distributing both for all managers on PETROJET.

23.5 Procedure

- In PETROJET there are two types of changes

1. Permanent change
2. Temporary change.

Permanent change

i. The initiator writes the change request showing the aim of this change and describes how this change will be applied.

ii. Initiator sends the request to the site / project manager who Review the technicality if this changes improving and useful in work or not

iii. If change request is accepted the Project manager sending it to Ass.CEO but if he reject the request he gives rejection reason and return the request to the initiator.

iv. The Ass.CEO using his authority for reviewing the technicality useful and how to apply this change without affecting the regulatory requirements and ensuring this changes will be safe when applied through held a meeting with interested parties to manage all necessary controls measures that ensuring all risks arising from these changes are managed to an acceptable level.

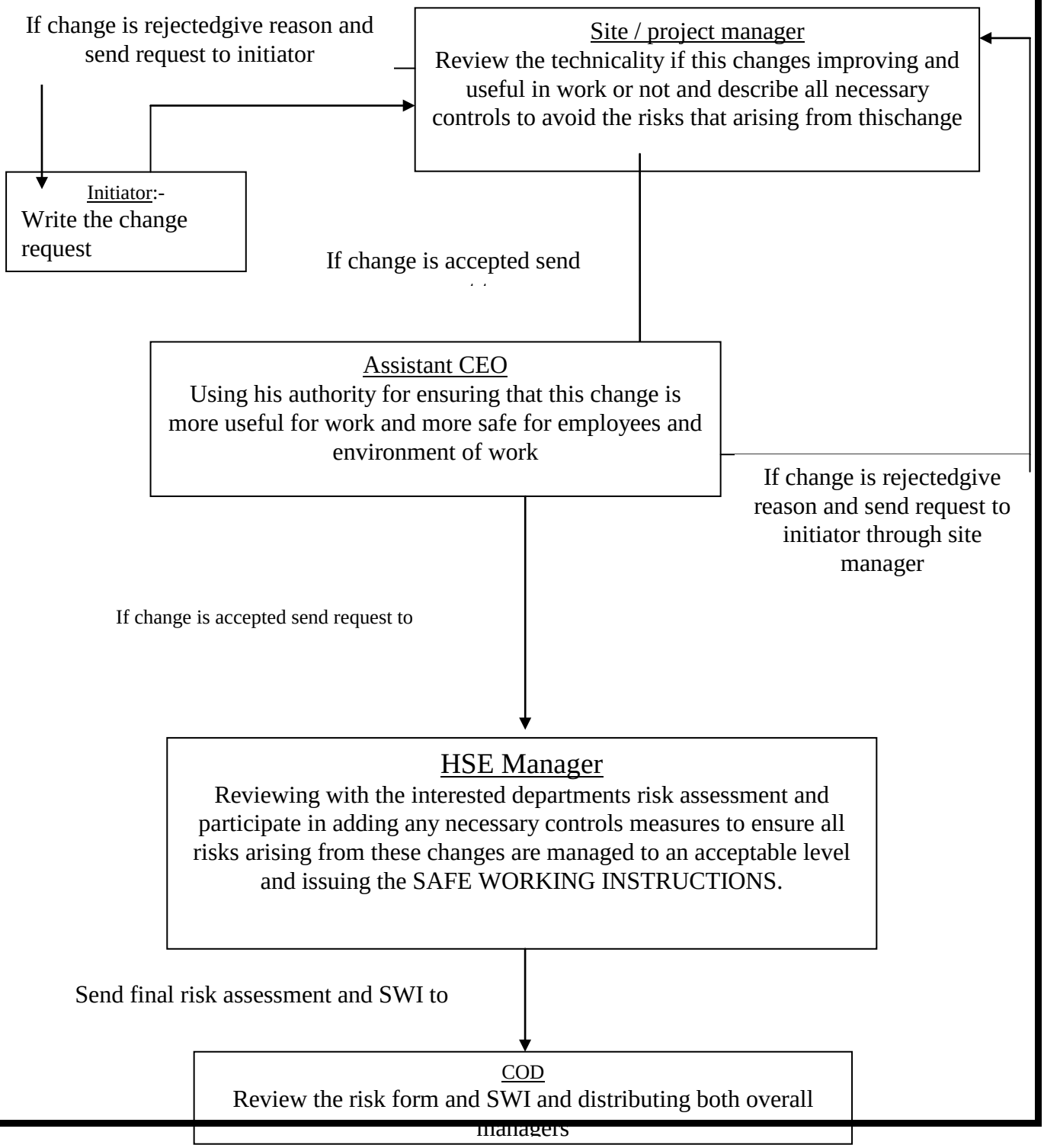
v. If Ass.CEO manager reject this change he return the change request to initiator through area manager.

vi. The Ass. CEO send the change request to HSE manager that coordinate and participate the meeting that discuses all necessary controls with interested parties and how this controls will be implemented on site and discuses the necessary all safe working instructions that will be applied.

vii. HSE manager send the change request, final risk assessment and the safe working instructions to the document controller that review the form of the risk assessment and safe working instructions forms and distributing both for all managers on PETROJET.

viii. HSE manager get the training feed back to ensure that all employees and operators are be familiar with this change and with Safe Working Instructions.

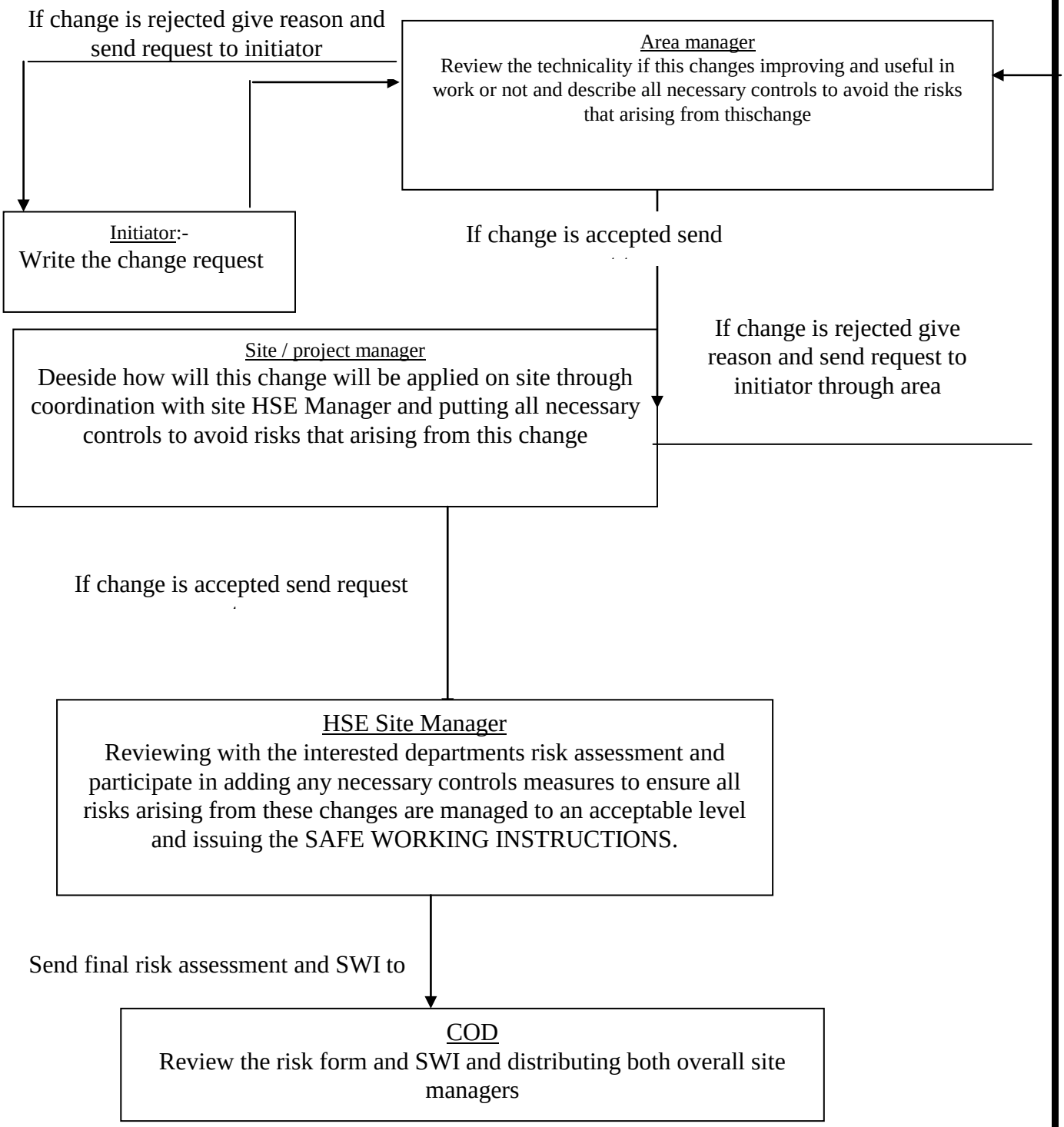
Figure (1) Permanent change Diagram:



Temporary change

i. The initiator writes the change request showing the aim of this change and describes how this change will be applied.
ii. Initiator sends the request to area manager who Review the technicality if this changes improving and useful in work or not and describe all necessary controls to avoid the risks that arising from this change.
iii. If change request is accepted the Area manager sending request to the site / project manager but if he reject the request he gives rejection reason and return the request to the initiator.
iv. The site / project using his authority for reviewing the technicality useful and how to apply this change without affecting the regulatory requirements and ensuring this changes will be safe when applied through held a meeting with interested parties to manage all necessary controls measures that ensuring all risks arising from these changes are managed to an acceptable level.
v. If Site / Project manager reject this change he returns the change request to initiator through area manager.
vi. Site / Project manager send the change request to HSE manager that participate the meeting that discuses all necessary controls with interested parties and how this controls will be implemented on site and discuses the necessary all safe working instructions that will be applied.
vii. HSE manager send the change request, final risk assessment and the safe working instructions to the document controller that review the form of the risk assessment and safe working instructions forms and distributing both for all managers on PETROJET.
viii. HSE manager get the training feed back to ensure that all employees and operators are be familiar with this change and with Safe Working Instructions.

Figure (2) Temporary change Diagram



24.Contractor Management

PJ - HSEMSP 4.4.6.15

24.1 Purposes.

Defining the operations and operational activities which have Significant Impact on the High Occupational Risk, and the followed methods to control it.

24.2 Scope.

Contractor management is one of the operational activities/ aspects which affect the HSE.

24.3 References.

1) ILO 1981, C155:-Occupational safety and health convention

2) ILO 1981, R164:-Occupational safety and health Recommendation.

3) ILO 2001, ILO-OSH: Guidelines on Occupational safety and health Management System

4) OHSAS18001:2007 Occupational Health & Safety Management system specification

5) BSI2002 , OHSAS18002 Occupational Health & Safety Management system Guidelines for the implementation of OHSAS18001

6) Egyptian Law No.(12) Year (2003) .

24.4 Definitions.

None

24.5 Occupational health and safety precautions which should provided by subcontractors

1) Provision of HSE supervisor exists all time during enforcement s/he should be obtained at least the following certificates:-

a) OSHA 30 hour's construction

b) Essential training in HSE (from the governmental agents)

2) Means of demonstrating employee competence, e.g. qualifications, experience, training, etc...

3) Arrangements for managing and supervision of employees (at least technical engineer & supervisor should be in place during operation).

4) Tool box talk should be held by the subcontractor's engineer prior to the job to distribute the responsibilities of the entire involved employee

5) Safety management documentation including policy, risk assessment, safe system of work, method statement and monitoring arrangement. (All these documentation should be approved from PETROJET'S before starting work.

6) Equipments, tools, lifting gears…etc valid certifications (original copies) should be introduced prior to work (all these certifications should be from one of the approved companies in PETROJET).

7) PPE should provide from the subcontractors for them employees (it is necessary to enter from PETROJET's main gate).

8) A detailed time scaled program should be submitted to PETROJET before work enforcement.

9) PTW should be obtained (from PETROJETHSE department) before work enforcement.

10) A written permission from subcontractor(s) states his promise to enforcing the job according to his detailed method of statement & that his representative(s) informed that the job may be stopped if there is any deviation during the work.

11) All subcontractor(s) employees who will involve in the job will attend a safety orientation in the PETROJETHSE training centre which will be done by HSE trainer (approximately time duration two hours).

12) All permits-to-work belonging to the governmental agents should be obtained e.g. transportation permit….etc.

13) A site meeting will be held (between subcontractor(s) representative(s) and all of PETROJET concerned departments at least a day before stating work.
14) A site contact will be nominated to liase with the contractor.
15) All documents should be introduced in ENGLISH language.

25.Performance Measurement and Monitoring

PJ - HSEMSP 4.5.1

25.1 Introduction

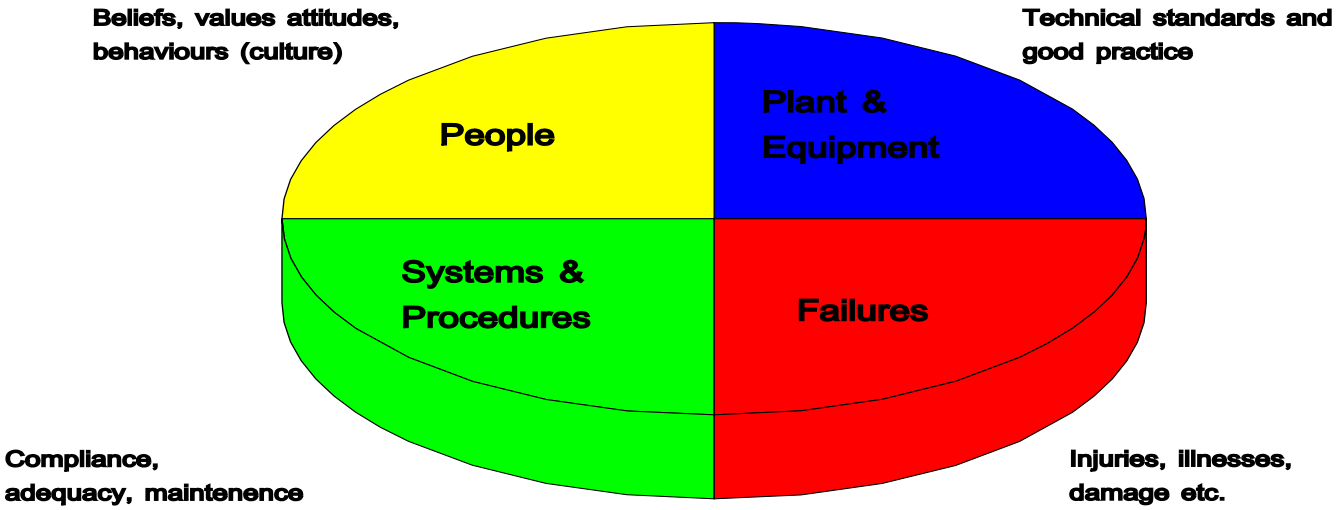
One commonly accepted definition of safety is the absence of danger from which harm could result. This being the case, then the only direct measure of achieved safety performance is in terms of the harm or loss that does occur, therefore reducing losses provides direct evidence of performance improvement. This also means that, success can be measured through absence of failures, and so injuries, illnesses, losses etc have to be measured - these are considered to be the 'bottom line' of safety performance [1].
Measuring outputs is characterized by two important limitations:-
a) When safety is good and injury loss rates are low, then those measurements are not sufficient to provide adequate feedback for managing HSE;
b) For PTJ operations onshore where there may be potential for severe accidents, the likelihood of such events must be extremely low. This means that the absence of very unlikely events is not, of itself, a sufficient indicator of good HSE management.
Therefore other - proactive - measurements of safety performance are necessary. There needs to be indicators which give the assurance that the absence or reduction of harm or loss is due to a systematic management approach which is aimed at preventing the occurrence of incidents. This approach contrasts with the reactive management approach, which initiates actions and programs after undesired events.
Safety is assured by providing:-
- Projects/sites and equipment which is 'fit for the purpose' of reducing the risks from identified hazards as far as reasonably practicable;
- systems and procedures to operate and maintain that equipment in satisfactory manner and to manage all associated activities;
- people who are competent, through knowledge, skills, attitudes, to operate the Projects/sites and equipment and to implement the systems and procedures;

These are positive inputs of safety management which are put in place to prevent the negative outputs (the failures). There are two maxims worth noting: 'Accentuate the positive to eliminate the negative' and 'You cannot manage what you do not measure'.
This means that performance indicators are also required for the positive inputs. Therefore safety performance has to cover four broad areas: three that are essentially positive

(Projects/sites/equipment, systems/procedures and training of people) and one that is essentially negative (the failure), see figure 1.

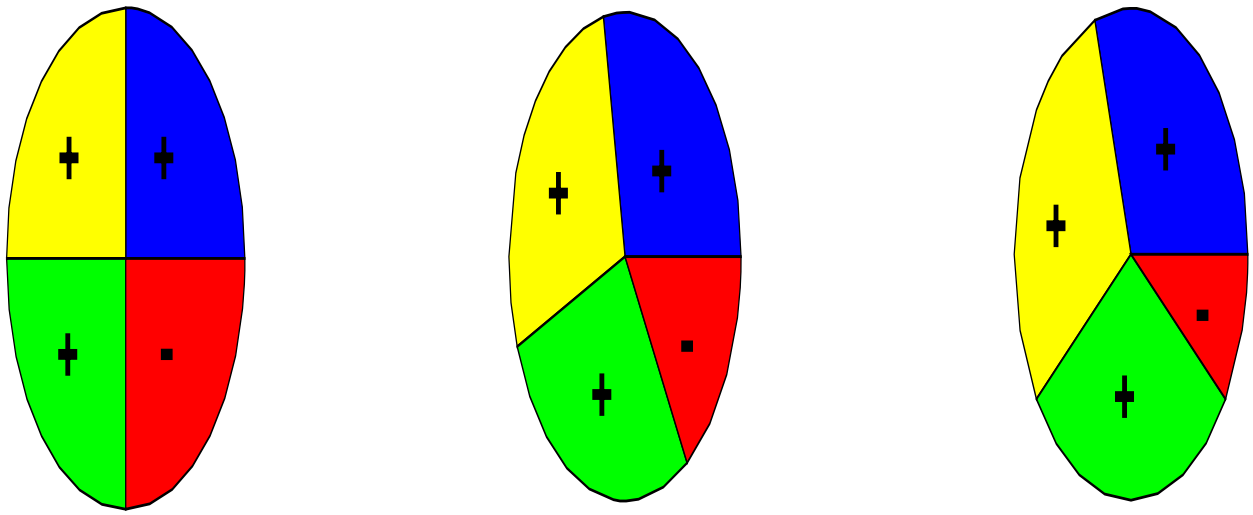
PTJ's philosophy for continual improvement in safety management is about proactively expanding the three positive inputs to reduce the one negative output - that is, to reduce the total of incidents which create harm and loss to people, environment and assets, see figure 2. This will enable the HSE management system effort to improve continuously in effectiveness and efficiency, thereby controlling and reducing the risks of the operation.

Figure 1



Safety performance measurement - areas to be covered

Figure2



'Accentuate the Positive to Eliminate the Negative'

This document describes PTJ's health, safety and environmental performance objectives for this year. The intention is to focus departments on 'positive' performance indicators; and to set appropriate health, safety & environmental performance targets for each department.

25.2 Scope

This document is applicable to all PTJ employees. The objectives contained within this document are to be considered as the minimum requirements for HSE performance.

25.3 Responsibilities

Responsibilities, CEO

It is the responsibility of the CEO to ensure that:-

a) HSE performance objectives are set and agreed annually for each department manager;

b) Sufficient levels of resources are available for each department to enable HSE performance objectives to be met.

c) The targets which have been set form part of the annual performance appraisals for each department manager;

Responsibilities, HSE Manager

It is the responsibility of the HSE Manager to ensure:-

a) HSE performance objectives are achieved within the safety & environment department;

b) The targets which have been agreed are reflected in the annual performance appraisals for his staff;

c) Auditable records are maintained;

d) Audits are carried out on HSE performance within all departments.

Responsibilities, Department Managers

It is the responsibility of each Department Manager to ensure that:-

a) HSE performance objectives are achieved within their department;

b) The targets which have been agreed are reflected in the annual performance appraisals for their department staff;

c) Auditable records are maintained.

25.4 Framework for performance measurement

The implementation of the inputs to safety management can be monitored by a variety of inspections, assessments and audits. These provide the means for positive measures of performance. The monitoring activities fall into three general categories:-

a) Regular, and often frequent, inspections carried out mainly by local management and staff. The frequency may be daily, weekly, monthly or less, depending on what is being inspected;

b) Systematic review of systems and procedures carried out mainly by local management and staff. The frequency will be annual or less, depending on what is being reviewed;

c) Specific training carried out mainly by local management and staff but may include specialized external training.

There should be some monitoring activity covering each of the above categories for each area of management input (Projects/sites, systems, training): each sector of the matrix in Table 1 should be covered. In practice, the distinction between sectors is not necessarily as definitive - often a particular training/inspection/audit/review activity will simultaneously cover all or part of several sectors of the matrix.

It is crucial that these measurements or indicators are fed back into the management loop in an understandable form, in order to enable the department manager to improve the safety management process of the operation.

The numbers in the matrix sectors of Table 1 indicate the main areas covered by the following general examples of inspection, assessment, audit or training activities:-

i) Compliance audits by local staff to verify the implementation of specific systems and procedures, in order to answer the question “Do we do what we say we do?”

ii) Inspections of Projects/sites, equipment and facilities by local staff - for example, examination and testing of proactive systems and devices; housekeeping inspections etc.

iii) Training in areas of skills, knowledge; and application of skills and knowledge (internal/external).

25.5 Key performance indicators

Key performance indicators or 'activities' have been placed into four broad areas, these are:-
competent people

- Projects/sites and equipment
- systems and procedures
- failures

Samples for HSE KPIs:-

- Lost time (in hours) due to accidents (including fatalities) per a determined period
- Number of fatalities pera determined period
- Number of non-conformance with legal or internal standards in safety inspections
- Number of reportable accidents per a determined period
- Number of solved safety non-conformances for the month
- Employee perception of management commitment
- Total of hours in safety and health training in the month

(For further information refer to OH&S personal contract PJ-HSEMSP-4.4.6-23)
For definitions relating to failures, see Accident/Incident Investigation & Reporting procedure [2].

25.6 Departmental objectives

OH&S performance objectives will be set for each department on an annual basis. Each performance indicator has been assigned a target figure for the year. The performance measurement shall be 80 % of the sum total of the performance indicators.
All activity indicators are equivalent in value - for example, if the agreed target of 12 fire evacuation drills is achieved or exceeded, then the value is = 1. However, failure to meet the agreed target would result in a value = 0.
A typical example of the four areas covered for HSE performance targets and how to calculate the actual measurement is provided in section 7.

25.7 Audit and review

The Safety Manager will, on behalf of the General Manager, carry out a 6 monthly review of each department's current
OH&S performance against agreed target objectives.

Example of OH&S performance targets.

Failures	Last year Data	This year Target	Performance Actual Value	
Number of first aid treatment				
Number of major injury cases				
Lost time incident (LTI)				
Number of days lost due to work				
Number of occupational diseases				
Number of restricted work cases(2)				
Number of medical treatment				
Number of near miss incidents				
Number of road traffic accidents				
Total reportable case frequency				
Lost time incident frequency				

Note 1. The number of incidents resulting in work related injury/illness requiring first aid medical treatment.

Note 2. The number of incidents resulting work related injury/illness in which the employee, the day after the event, were, (a) assigned to a temporary job, (b) worked at a permanent job less than full time, or (c) worked at a permanently assigned job but were unable to perform all duties normally assigned to it.

Note 3. The number of incidents resulting in work related injury/illness requiring medical treatment (more than fist aid) from a professional physician or qualified medical person and where there is no lost time from the day after the incident if this a normal working day)

Note 4. Actual figures of TRCF and LTIF will be provided by the OH&S department.

People	Matrix No.	Target	Performance Actual Value	
Safety meetings(1)	iii			
Safety induction(2)	iii			

Note 1. Safety meetings: this shall include formal meeting in which OH&S matters are discussed.

Note 2. Safety induction: this shall include induction training and refresher training.

The following information provides an example of how the final performance measurement will be calculated:

25.8 References

a. 'Material from 'Safety Performance Measurement', copyright EPSC, 1996 and published by The IChem E is reproduced with permission'.

b. OSHA 300

c. Accident/Incident Investigation & Reporting procedure PJ-HSEMSP-4.5.2

d. Personal contract PJ-HSEMSP-4.4.6-23

26.1 Accident Investigation

26.1.1 Introduction

Safety reporting philosophy

"...we will openly report our performance, good and bad....."

26.1.2 Purpose of the Safety Performance

Information

Safety performance data collected by PETROJET HSE Team is used to:

- evaluate monthly and annual performance trends
- monitor performance against targets

Selectively share with our benchmarking partners to compare performance between companies and sectors when available

26.1.3 Scope of reporting

We will openly report our performance, good and bad - We will work with others - our partners, suppliers, competitors and regulators - to raise the standards of our industry. To influence that performance, reporting of HSE performance data is an important first step.

26.1.4 Lagging indicators to be reported

- Fatalities
- Days away from work (DAFW) injury and illness cases
- Total recordable injury and illness cases (Days Away from Work – Restricted Workday – Medical Treatment
- First aid cases
- Near Miss

26.1.5 Leading indicators to be reported

- Safety observations
- Tool Box Talk
- Risk Assessment
- Work Permits
- Safety training hours
- Closure of actions on time

26.1.6 Lagging Indicators

- DEFINITIONS (Source: OSHA 300)

Occupational Illness

Any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases, which caused by inhalation, absorption, ingestion or direct contact.

Fatality

A recordable, work related fatality.

Days away from work case

A work related injury or illness other than a fatal injury which results in a person being unfit for work on any day after the day of occurrence. Restricted work cases are not included in this category.

Restricted workday case

A work related injury or illness other than a fatality or days away from work case which results in a person being unfit for full performance of the regular job on any day after the injury or illness. Work that can be performed might be:

- an assignment to a temporary job
- part-time work at the regular job
- continuation at the regular job but not
  Performing all the usual duties of that job
  Where no meaningful restricted work is being
  Performed, the incident is recorded as a DAFW.

Medical treatment case

Cases that are not severe enough to be reported as fatalities or DAFW cases or restricted work day cases but are more severe than requiring simple first aid treatment.

Aid

A treatment for a work related injury or illness that does not ordinarily require medical care, regardless of who provides treatment. OSHA considers only the following types of treatments as first aid cases (any other type of treatment is to be considered a Medical Treatment or a Restricted Injury) :

1- Non prescription medications.

2- Tetanus shots.

3- Cleaning surface wounds.
4- Bandages, butterfly bandages and steri-strips.
5- Hot/cold therapy.
6- Non-rigid support.
7- Temporary immobilization devices while transporting
8- Drilling of nail.
9- Eye patches.
10- Removing foreign bodies from eye by using only irrigation and cotton swab.
11- Removing splinter from other than eye by irrigation, tweezers or other simple means.
12- Finger guards.
13- Massages.
14- Drinking fluids for relief of heat stress.

- **Near Miss**

An undesired event, which, under slightly different conditions, could have resulted in harm to people, damage to the environment & property loss.

- **Initial Incident Announcement**

An incident or near miss, where the most probable outcome is an Accident.

- **Major Accident Announcement (MAA)**

An accident including:

- Fatality
- Multiple SERIOUS injuries
- Significant adverse reaction from authorities, media or general public.
- Cost of accident damage exceeding $1,000,000
- Oil spill more than 100 barrels release of more than 10 tones of Chemicals

26.1.7 Leading Indicators

- Safety Observations

A documented observation of safe and an unsafe acts and conditions by the workforce. Examples include:

- Behavior-based programs
- Inspection programs

The rule to be followed for counting observations is that multiple observations can be counted separately as long as the observations are distinctly different. For example, a card

that documents two observations regarding an unclean worksite should be counted as one, whereas two separate observations of an unclean workplace and a worker not wearing proper PPE captured on one card can be counted as two observations.

- Safety Training

Hours of safety training led or sponsored by PETROJET. Examples include:

- Safety Orientations
- G HSER (HSE Management Training)
- Safety-Behavior programs
- Technical Training (Lifting/Vehicle/…)
- First Aid
- Confined space entry
- Energy isolation
- Working at heights
- Risk management processes
- Defensive driving
- Ground disturbance
- Management of change
- Personal protective equipment
- H_2S
- Proper lifting techniques

Basic awareness discussions conducted during routine safety meetings should not be included. Training of contractors should not be included unless training is conducted by a PETROJET employee or consultant

5.1 Closure of Actions

Closure of actions resulting from HSE incident investigations and HSE Audits.

26.1.8 Transportation Definitions

➢ Vehicle Incidents:

Any unplanned incident involving:

➢ All motor Vehicles:

Includes heavy vehicles (3.5 tonnes and heavier), light vehicles (under 3.5 tonnes), self-propelled mobile plant. This includes accidents when using a hire/rental vehicle on company business, or when using a private vehicle on company business for which a member of the workforce is reimbursed.

➢ Work Related Kilometers:

The number of kilometers driven during work related activities. This includes all work related kilometers driven in hire/rental vehicles, or private vehicles (see all motor vehicles definition above).

➢ Motor Vehicle Accident

An accident involving a motor vehicle resulting in injury, or loss/damage, or harm to the environment, whether this impacts PETROJET and or/its contractors directly, or impacts the third party. This is irrespective of whether the accident was preventable or non preventable. It excludes all accidents where:

- The PETROJET workforce vehicle was legally parked
- The journey is to or from the driver's normal place of work
- Minor water wear and tear is the case (eg.: stone damage to a windscreen, minor paint work damage)
- An incident is the result of vandalism, or theft

A company provided vehicle is being driven on non-work related activities (eg. Private business, leisure)

26.1.9 Spill Definitions

a) Spills:

The unplanned or accidental loss of primary containment from any operation owned or operated by PETROJET or managed by a contractor on behalf of PETROJET, irrespective of any secondary containment or recovery. In all cases, if a spill or release reaches or is likely to reach surface water, the event will be reported.

b) Oil, Condensate, Produces Water Spill:

An oil, condensate, or produced water spill is definedas a release from primary containment of any form of oil, condensate, or produced water. Oil is defined as crude oil, lubricating oils, hydraulic oil, gasoline and diesel fuels, aviation fuel, kerosene, and any other products refined from crude oil. Synthetic lube oils are included.

c) 8.1.2 Chemical Spill:

A chemical spill is defined as a release from primary containment of any pure chemical, chemical mixture or compound (excluding gaseous releases to the atmosphere) for which an MSDS is required.

d) Hydrocarbon gas releases:

Any unplanned or accidental hydrocarbon gas release in any quantity that escapes primary containment and is determined to be an immediate HSE hazard to workers or the general public

26.1.10 Fire Definition

e) Fire and explosions:

Any unplanned incident involving PETROJET property, equipment or operations that results in a flame, excessive heat or combustion resulting in a fire or explosion.

26.1.11 Actions Closure Procedures

- investigation, near miss reports, audits, etc. should be identified and agreed by Project management and sent to the concerned department (HSE) once the event report is completed.

  The site HSE department will track those actions and ensure their closure.

- Five days ahead of each month the HSE representative in each site will send a communication to the concerned department reminding of the actions due in the following month.

- By the end of each month the HSE representative Onsite will collect /follow up on the status of all the actions due / closed /open of the current month and report it to the main offices in Cairo .All corrective actions resulting from incident

7.0 Timelines for Data Reporting

Means of Reporting	When	Responsible Party	Description	Type of report
Daily Report	Daily	The site HSE Rep	Safety observations Tool Box Talk Risk Assessment Work Permits Safety training hours Closure of actions on time	**Inputs Data**
A written report/card..	As Soon As Possible	Any observer, who identifies a Near Miss can report it by filling out a Near Miss card and hand it to the responsible party in the area. The responsible party is to handle the Near Miss as he sees fit, than provide feedback to the observer. All appropriate information shall be cascaded to the general workforce at the earliest opportunity .	An undesired event, which, under slightly different conditions, could have resulted in harm to people, damage to the environment & property loss .	**Near Miss**
Quickest possible mean phone and Initial Incident Announcement till preparing the Investigation Report	As Soon As Possible	The site HSE Rep	DAFWC, First Aid, Medical Treatment, Restricted Injury, vehicle accident, and Major Accident	**Outputs Data**
By Emails	By the 7th. of each month	HSE Rep Project Rep	Total numbers of inputs and outputs described above in addition to number of man working hours and kilometer driven..	**Collective HSE Data**
By Emails	By the 7th. of each month	The site HSE Rep	All monthly actions due from investigation reports, safety meetings &HSE audits..etc.	**Action Closure Report**
Investigation Report	Once completed	The site HSE Rep	To include short/long description of the incident, corrective actions, severity and root cause analysis	**Incident Investigation Report**
Major Accident Announcement Form	Within 24 hrs of the accident	Project Manager	See definitions	**Major Accident Announcement**

Timelines for Data Reporting

26.1.12 PETROJET Incident Investigation elements and minimum requirements

❖ Element 1: Be ready to investigate

1. Any incident (defined as petrojet reportable) occurring at a PETROJET entity shall be investigated.
2. The incident's actual severity (see Appendices 2 and 2a) shall dictate the level and type of incident investigation.
3. PETROJET Leaders shall select a pool of people to serve as incident investigation team leads in the event of a reported incident.
4. PETROJET Leaders shall ensure that persons assigned to the pool of incident investigation team leads are trained to a basic competence level and their skills developed to conduct a thorough incident investigation.

Recommendations:

- Incident investigation team leads are considered "trained" upon completion of a standardized 8 hour training program that instills basic level competency for Root Cause Analysis.
- Because the skills required for effective incident investigations are best developed by practicing on actual incident investigations, employees and their supervisors should work together to ensure development opportunities after training.
- The pool of incident investigation team leads should be such that incident investigation team leads have active participation in two incident investigations per year after training to develop and maintain the skilful application of investigative techniques
- Incident investigation team leads called on to investigate Level A-E incidents should receive additional training.
- Incident investigation teams should be led by trained incident investigation team leads; however, they may draw on the knowledge of subject-matter experts and others who have not been formally trained, but who demonstrate a general awareness of Root Cause Analysis techniques and terminology from participation in routine safety activities, such as reading lessons learned reports, discussing past incidents in safety meetings and reviews, and by participating in incident investigations–as either a witness or a junior team member.
- Untrained people should not lead incident investigation teams.

❖ Element 2: Get Mobilized

5. In the event of an incident requiring investigation, PETROJET Leaders/HSE Management team shall select incident investigation team leaders from the pool of incident investigation team leads.
6. Incident investigation team leads shall be given adequate relief from their normal duties to complete the incident investigation.
7. The incident scene shall be released for resumption of work only at the direction of the incident investigation team and any involved regulatory or law enforcement bodies.
8. The incident investigation team shall consult with PETROJET Legal at the start of all investigations of Level A-E incidents, and in any other incident investigation where the possibility of regulatory action or litigation exists.
9. The incident investigation team shall conduct the sole PETROJET incident investigation into the facts leading to the incident, and shall pursue any reasonable line of inquiry to establish evidence addressing what happened, how it happened and why it happened

Recommendations:

- First responders from PETROJET emergency services should be trained in scene preservation.
- The entity's PETROJET Leader should retain full responsibility for managing all post-incident aspects other than the incident investigation itself.
- Regardless of whether the first responders are municipal or from PETROJET, the PETROJET personnel should take all reasonable steps to identify and preserve evidence, consistent with the response necessary to prevent further injury, to protect the environment, to protect assets and to meet regulatory requirements. This may include barricading the scene, posting a guard, creating chain of custody documents, or similar actions. Special attention should be given to time sensitive information, such as computer data files and photography of the site.
- All such evidence collected should be held for the incident investigation team.
- An agreed upon Terms of Reference should be created to guide incident investigation activities

.

- Additionally, a Terms of Reference is also maintained and distributed with PETROJET personnel trained to investigate Level A-E incidents.

- The incident investigation team leader should brief incident investigation team members who have not been trained as incident investigation team leads on incident investigation tools and techniques before the incident investigation starts.

❖ Element 3: Conduct the investigation

10. The incident scene shall be properly preserved upon completion of first responder activities.

11. The incident investigation team shall conduct their incident investigation independently, without interference from other parties.

Recommendations:

- At the time of the incident, an entity's PETROJET Leader should utilize their best judgment as to incident severity, and investigate as per that protocol. If the incident severity level is not clear, refer to Appendices 2 and 2a.

- The incident investigation team should maintain the confidentiality of the investigation materials, controlling the flow of information regarding the incident investigation and releasing information only when they find it prudent or necessary to do so. However, the incident investigation team leader should periodically update the entity's PETROJET Leader as necessary to maintain site operations and fulfill other responsibilities.

- The decision to release materials related to the incident investigation, i.e. machinery or access to roads, should be made with the concurrence of the incident investigation team.

- The basic RCA training program, including the CLC and glossary, are recognized as PETROJET's preferred method for conducting an incident investigation, as it results in a quality investigation that identifies and provides for the correction of root causes that allowed the incident to occur.

- Where the entity's Local Operating Management System does not require a formal incident investigation of a particular level of incident, incident investigation team leads shall utilize techniques appropriate to the severity of the incident, as defined in Appendices 2 and 2a.

❖ Element 4: Report the findings

15. An Incident investigation report, consistent with PETROJET's preferred format, shall be made of the incident investigative team's findings and conclusions. (See Appendix ٦).

16. The incident investigation report shall include proposed corrective actions

Recommendations:

- An entity's Local Operating Management System should establish expectations for the nature and extent of information required in incident investigation reports based on each level of incident severity. The requirements should change based on the level.

- The timing for completion of the incident investigation and production of the incident investigation report should be identified in the Management System. Generally, these activities should be completed within 15-30 days of the incident. When extraordinary circumstances exist which would delay the report the management practice should describe the additional approvals and mitigations necessary.

❖ Element 5: Act on the findings

17. The incident investigation team shall address their report to the PETROJET Leader with accountability for the area or operation where the incident occurred.

18. The report recipient shall determine and document with reasons which of the proposed corrective actions shall be accepted, which shall be modified and which shall be rejected.

19. For those actions accepted or modified, the report recipient shall establish a project schedule and assign personnel to complete those actions.

20. The report recipient shall obtain progress reports from assigned personnel and ensure completion of the tasks required to meet the proposed corrective action.

21. The report recipient shall complete an investigation summary report for any MAA or HIPO investigation using the pro-forma in Appendix ٤, and circulate to the MAA and HIPO distribution list.

Recommendations:

- The incident investigation report should be addressed to the PETROJET Leader having area of responsibility for the incident, who has the authority to address all proposed corrective actions.
- The incident investigation report should reflect the findings of the incident investigation team and should represent a consensus among incident investigation team members.
- Tracking system should be used to establish schedules and assign personnel to complete recommended corrective actions.

- PETROJET Leaders should establish a process in the Management System for tracking tasks arising from accepted corrective actions and to verify that all necessary tasks have been completed.

26.1.13 ROLES AND RESPONSIBILITIES

26.1.13.1 Senior Management (PETROJET Leaders)/HSEGM

The most senior person who is responsible for the facility/District/project where the incident occurred is the Owner of the Investigation. This individual will:

- Appoint Investigation Team members, for MAA and HiPo incidents to ensure an independent assessment of the root causes as soon as practicable.
- Provide resources & support as appropriate to ensure the Team delivers an investigation report on time.
- The entity's PETROJET Leader should issue the Major Accident Announcement when appropriate.
- The HSE GM shall take steps to properly preserve physical and paper evidence of the incident pending the appointment of the incident investigation team.
- The entity's PETROJET Leader shall provide access to the scene, the people involved and other evidence necessary for the incident investigation team's work.

- The entity's PETROJET Leader shall coordinate other investigations into the incident, such as regulatory agency or police investigations.
- The entity's PETROJET Leader should review the draft incident investigation report to identify any factual errors .
- The HSE GM should work jointly with the incident investigation team to create an appropriate "Lessons Learned" communication.
- The entity's PETROJET Leader to whom the incident investigation report is addressed shall be responsible for considering and acting on the recommendations contained in the incident investigation report.
- The entity's PETROJET Leader should maintain all materials related to the incident and its investigation in accordance with documentation requirements until legal approval to destroy is obtained.

26.1.13.2 The investigation team leader

The Investigation Team Leader will ensure the following:

- Reports directly to the 'Owner' of this investigation
- With the Owner, appoints an Investigation Team
- Represents the investigation team when communicating information
- Provides a daily update to the Owner
- Ensures that PETROJET processes for reporting incidents have been met (MAA, HiPo, etc)
- Is responsible for seeking legal advice prior to issue of any documentation
- Delivers the Investigation Report within the agreed time frame

26.1.13.3 The root cause specialist

- Provides guidance to the investigation team on the strategies & methodologies to be used throughout the investigation.

26.1.13.4 The investigation team

The Investigation Team will ensure the following:

- An incident investigation team leader and a Root Cause Specialist shall be appointed in line with procedures.
- The balance of the incident investigation team members should be drawn from the local entity, with the concurrence of the incident investigation team leader.
- The incident investigation team generally should include members of the PETROJET Workforce, but should not include people who were directly involved with the incident or people who supervise the area where the incident occurred.
- The incident investigation team leader should add additional incident investigation team members for specifically needed expertise.
- Contractor representatives should be encouraged to participate if a contractor was involved in the incident.
- Incident investigation team size should be kept as small as is reasonable—generally not more than 4 to 6 members are recommended.
- The incident investigation team shall conduct the sole PETROJET investigation into the incident.
- The incident investigation team should generally limit their efforts to the conditions and circumstances leading to the incident, and should avoid doing a general safety audit.
- The incident investigation team shall pursue any reasonable line of inquiry to establish evidence addressing what happened, how it happened and why it happened.

- · The incident investigation team leader should provide periodic updates to the entity's PETROJET Leader and/or the HSE GM on the progress and findings of the incident investigation.
- The incident investigation team shall utilize appropriate Root Cause Analysis techniques in performing the incident investigation.
- The incident investigation team should create a draft report and review it with the entity's PETROJET Leader, HSE GM and legal, if appropriate, before issue.
- After considering the comments on the draft report, the incident investigation team shall complete a final report utilizing the preferred template provided.
- The incident investigation team should collate all investigation materials and secure them per local procedure.
- The incident investigation team should work jointly with the entity's PETROJET Leader/ HSE GM to create an appropriate "Lessons Learned" communication.
- The incident investigation team's report will be addressed to the PETROJET Leader with accountability for the area or operation where the incident occurred.

26.1.13.5 Line Managers

- Communicate immediately to the Senior Mangers and HSE General Manager of any incidents.
- Ensure that a preliminary written MAA / HiPo report has been prepared and sent to the HSE General Manager.
- Participate and facilitate in the investigation process.
- Ensure an Incident Investigation Form and if required, a formal investigation report is submitted to the concerned senior manager & HSE General Manager within 24 hours and 10 days (respectively) after the event. If the investigation is on progress, In which case an interim status report of the investigation shall be sent to them.
- Ensure findings, recommendations and lessons learned from incident investigations are widely communicated, understood and implemented by all personnel.

26.1.13.6 Site Managers (Entity PETROJET Leader)

- The entity's PETROJET Leader/HSE GM should issue the Major Accident Announcement when appropriate.
- The entity's PETROJET Leader shall take steps to properly preserve physical and paper evidence of the incident pending the appointment of the incident investigation team.
- The entity's PETROJET Leader shall provide access to the scene, the people involved and other evidence necessary for the incident investigation team's work.

- The entity's PETROJET Leader shall coordinate other investigations into the incident, such as regulatory agency or police investigations.
- The entity's PETROJET Leader should review the draft incident investigation report to identify any factual errors or omissions.
- The entity's PETROJET Leader/HSE GM should work jointly with the incident investigation team to create an appropriate "Lessons Learned" communication.
- The entity's PETROJET Leader to whom the incident investigation report is addressed shall be responsible for considering and acting on the recommendations contained in the incident investigation report.
- The entity's PETROJET Leader should maintain all materials related to the incident and its investigation in accordance with documentation requirements until legal approval to destroy is obtained.

26.1.13.7 Team Leaders / Supervisors

- Notify senior Manager of any incidents immediately.
- Accountable of the preservation of evidences at the scene, as well as any related documents and registers.
- Participate in incident investigation activities as required by senior Manager.
- Ensure all recommendations resulting from incident investigation reports are communicated to all personnel (including contractors).

26.1.13.8 Site HSE Advisor / MGR

- Maintain the incident investigation and reporting procedure and standard forms to be used to reporting.
- Provide incident investigation training and support to those likely to be assigned to an investigation team.
- Ensure an administration system for Incidents documentation control. Keep records of all incidents (despite severity) and the report forms.
- Monitor status of all recommendations until they are completed.
- Preserve document files with reports as well as any additional documentation on site.

- Maintain and submit daily and monthly statistical data to HSE Manager.
- Assist HSE Manager in monitoring of first aid, medical cases, property damage, and contractor performance reports; ensure all incidents are being reported and investigated appropriately.

26.1.14 Investigation Process –Root Causes Analysis (CLC)

The Investigation Team shall perform a methodical examination of the event. Investigation activities shall be directed toward defining the facts and circumstances related to the event, determining the causes and developing remedial actions to control the identified risks.

As main investigation tool, the Team will use Root Cause Analysis Techniques, which includes the Comprehensive List of Causes (see appendix :٨) as well as the "Incident Outcome, Actual & Potential Severity Matrix".

The Root Cause Analysis sequence is:

- Investigation planning
- 4P technique (people, positions, parts, paper)
- Interviewing
- Use of building blocks
- Determination of Critical Factors
- Use of the List of Causes to determine immediate, basic and system causes.
- Selection of Corrective Actions
- Reporting

The investigation shall be aimed to clarify:

- The sequence of events and consequences
- Other potential events and consequences (what else could have happened)
- Deviations from requirements, plans and procedures
- Human, technical and organizational causes
- Which barriers failed, why they failed and which barriers should have been established
- Which barriers worked, i.e. what stopped the incident and its further escalation

Filling of Incident Investigation Form

The Incident Investigation Form (Appendix ٦) will guide the Investigators to classify the event according to the outcome.

- Section A: General information and the incident classification.
- Section B: Short & long description of the incident and the immediate action(s) taken.
- Section C: Actual & potential severity matrix
- Section D: Comprehensive list of Causes, Critical Factors, Immediate & system causes.
- Section E: Corrective actions
- Section F: this section for injury/ illness report
- Section G: this section for Material Release report
- Section H: this section for Transportation Incident report
- Section I: this section for Loss or property damage
- Section J: this section for Fire /Explosion
- Section K: this section for Report Approval

26.1.15 Administration Rules

26.1.15.1 Investigation Report completion time & content

The initial notification of any incident

(see Appendix ٧) shall be completed & distributed according to the incident severity . The Investigation Report Form (Appendix ٦) shall be completed and distributed within 48 hours after the incident. A formal Investigation Report shall be available within two to four weeks after the incident if an external Investigation Team is required. All documentary and photographic evidence collected shall be included as appendix.

The content of any formal report should be:

Introduction
Summary
Investigation
Sequence of Events
Investigation Methodology
Immediate causes
System causes and corrective actions
Additional Findings
Corrective actions
Appendices

26.1.15.2 Distribution and Filing of the Investigation Report

The HSE General Manager will decide on the distribution of the full report, in particular which findings and "lessons" learned" are to be shared with others both inside and possibly outside PETROJET .

The Investigation Report shall be distributed according to the PETROJET Incident distribution Protocol. The original Investigation Report and Evidence File shall be kept by the HSE Department in Cairo; copies might be distributed at the site HSE Advisors in different department & sites.

26.1.15.3 Recommendations and Follow Up

Once the report is available, HSE General Manager should review the findings and recommendations and agree on their course of action. The final report should contain management responses to all recommendations with clear delegation of responsibilities for actions. A time scale for review or completion is essential. .

Persons who have been assigned with actions shall provide regular reports to the HSE Central Team to ensure follow up and further close out.

he HSE Department shall issue a monthly report with the information of actions closed, overdue, and open, etc., and recommend different approach to closeout.

26.1.15.4 Sharing Learning's lessons

Investigation resumes (single pager Reports-Appendix ٥) will be distributed to all the departments, with approval from the HSE General Manger. It is the responsibility of the Line & Senior Managers to share learning's and implements related actions as appropriate in their own.

26.1.15.5 Trend Analysis

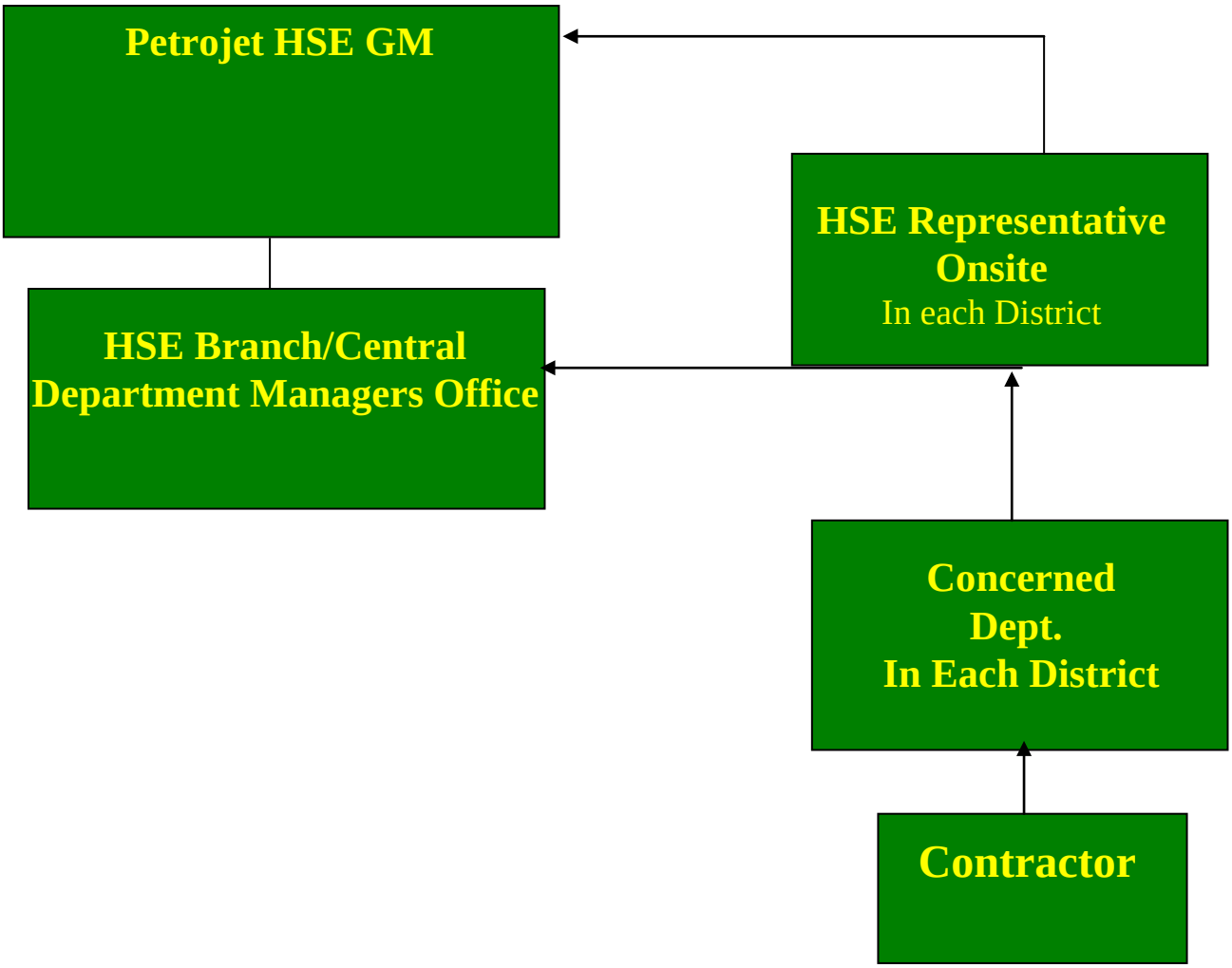
The HSE Department shall issue monthly, quarterly and annual statistics on incidents and causes.

26.1.16 Appendices

1. Incident notification chart
2. Matrix to record severity of Actual Consequence
   a) Severity Matrix-HSE impact Level.
   b) Severity MATRIX –Business Impact Level
3. Loss of primary containment Potential Severity Classification
   c) a) Severity classification-LOPC of flammable gasses & liquids
   d) b) Severity CLASSIFICATION –LOPC of toxic substances
4. Level A-D & E Major Accident Announcement
5. Lessons Learned Form
6. Egypt SPU Incident investigation form
7. Egypt SPU Initial Incident Notification form
8. Comprehensive List Of CAUSES (CLC)

Appendix1 Incident notification chart

Inputs/Outputs Data Reporting



Appendix 2 **Matrix to record severity of Actual Consequence**

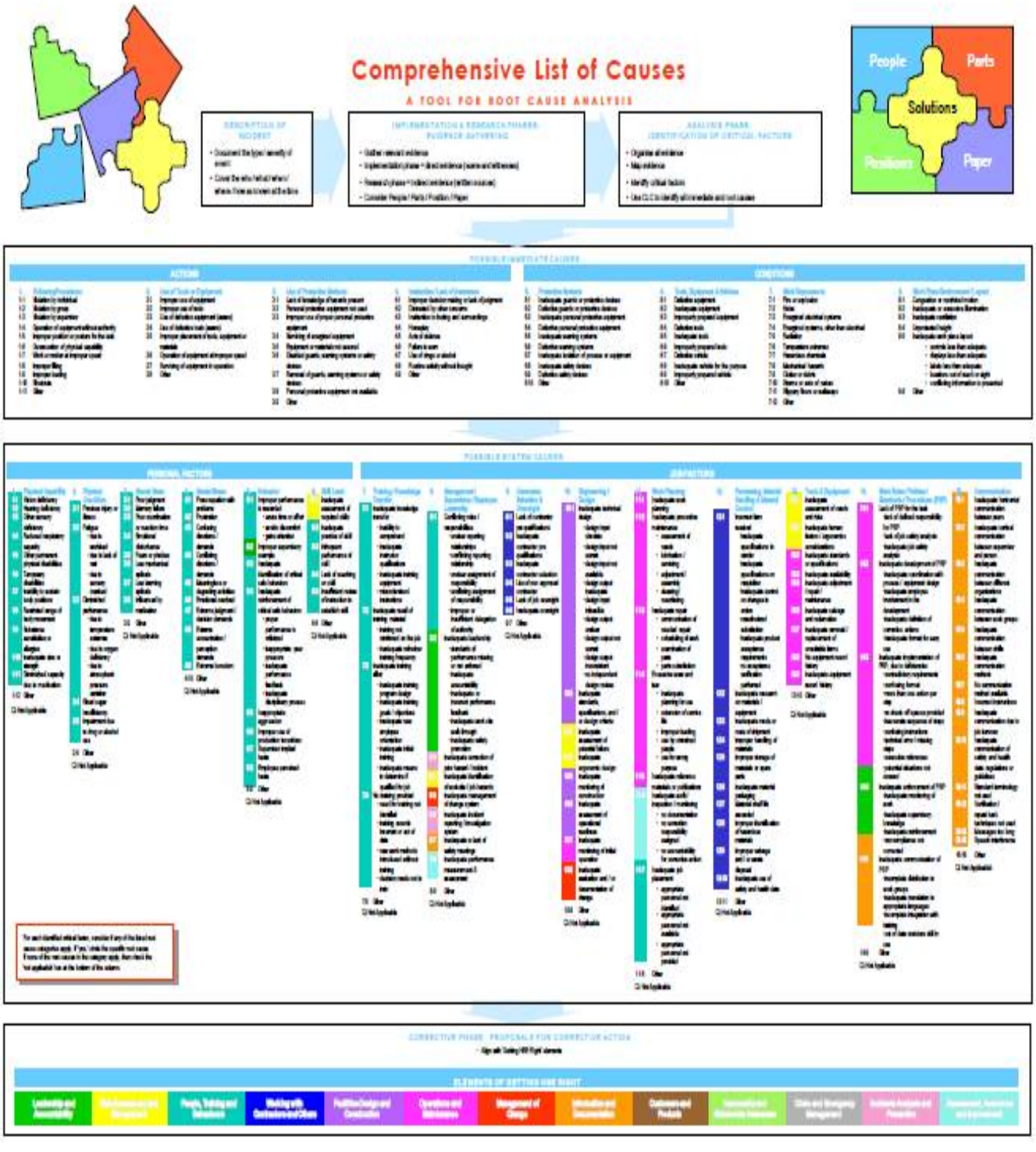
a) Severity Matrix-HSE impact Level.

SEVERITY LEVEL	HEALTH AND SAFETY	ENVIRONMENTAL	Investigation Required
A-D	* 3 or more fatalities, acute or chronic, actual or alleged. * Identified onset of life threatening health effects in 3 or more workers * 30 or more injuries or health effects to PETROJET workforce, either permanent or requiring hospital treatment for more than 24 hours	* Event with widespread or extensive damage to any environment and that remains in an "unsatisfactory" state for a period > 5 years. *Event with widespread or extensive damage to a non-sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of months or up to 1 year. * Event with localized or extensive damage to a sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of months or up to 1 year. *Event with widespread or extensive damage to a non-sensitive environment and that can only be remediated to a "satisfactory" / agreed state in a period of 2 - 4 years. *Event with extensive damage to a non-sensitive environment and that remains in an "unsatisfactory" state for a period > 5 years. *Event with widespread or extensive damage to a sensitive environment and that can only be remediated to a "satisfactory" / agreed state in a period of 2 - 4 years.	An externally led investigation team is required, as described in Element 3 (Page 11) of this procedure
E	* 1 to 2 fatalities, acute or chronic, actual or alleged. * 10 or more injuries or health effects to PETROJET workforce, either permanent or requiring hospital treatment for more than 24 hours.	* Event with localized damage to a non-sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of @ 1 year. * Event with extensive damage to a non-sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of months. * Event with localized damage to a sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of months. * Event with extensive damage to a sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of days or weeks.	
F	* Permanent partial disabilities * Several non-permanent injuries or health impacts * DAFWC	* Event with localized damage to a non-sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of months. * Event with immediate area damage to a sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of months. * Event with extensive damage to a non-sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of days or weeks. * Event with localized damage to a sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of days or weeks.	A formal incident investigation is required, as described in Element 3 (page 11) of this procedure Specifically, formal incident investigation involves the naming of a specific incident investigation team, the use of appropriate evidence-gathering techniques and the CLC Chart for Cause Analysis, resulting in an Incident Investigation Report to be reviewed by the next level of management. Note: The requirement for a formal incident investigation may be waived by an entity's PETROJET leader if the case is classified as DAFWC solely due to conservative medical care.
G	* Single or multiple recordable injury or health effects from common source/event	* Event with immediate area damage to a non-sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of months. * Event with localized damage to a non-sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of days or weeks. * Event with immediate area damage to a sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of days or weeks.	Events of this severity shall be investigated at a level deemed appropriate by the entity's PETROJET leader. RCA is recommended, but a less rigorous approach is acceptable depending on the nature of the incident
H	* First aid. * Single or multiple over-exposures causing noticeable irritation but no actual health effects	* Event with immediate area damage to a non-sensitive environment and that can be remediated to a level that restores its environmental amenity in a period of days or weeks.	Events of this severity shall be investigated at a level deemed appropriate by the entity's PETROJET leader. RCA is recommended, but a less rigorous approach is acceptable depending on the nature of the incident.

b) Severity MATRIX –Business Impact Level

SEVERITY LEVEL	EQUIPMENT DAMAGE, BUSINESS VALUE LOST	PRIVILEGE TO OPERATE	Investigation Required
A-D	*>$100m BVL *>$10m equipment damage	* Public outrage or brand damage in major markets where we have presence or aspiration. * Global or Regional media coverage or Severe National Outrage. * Actual or threatened Loss of License to Operate. * Likely to lead to change of local, national or international regulations.	An externally led investigation team is required, as described in Element 3 (Page 11) of this procedure
E	*$5m to $100m BVL *$1m-$10m property & equipment damage	* Localised or limited "interest-group" outrage in major market. * Public or investor outrage in non-major markets. * Significant enforcement action against one or more material assets in a significant market (e.g. US, Europe).	
F	*$500k-$5m BVL *$100k-$1m property & equipment damage	* Prolonged local media attention. * Other enforcement action against one or more material assets in other market (not US or Europe) with a foreseeable end date.	A formal incident investigation is required, as described in Element 3 (Page 11) of this procedure . Specifically, formal incident investigation involves the naming of a specific incident investigation team, the use of appropriate evidence-gathering techniques and the CLC Chart for Cause Analysis, resulting in an Incident Investigation Report to be reviewed by the next level of management
G	*$50k -$500k BVL *$25k-$100k property & equipment damage	* Short term local media coverage. * Some disruption to day to day lives (e.g. loss of single road access less than 24 hours). * Fines or other penalties significant to a BU.	An informal incident investigation, one that is fit-for-purpose, is required as described in Element 3 (Page 11) of this procedure.
H	*<$50k BVL *<$25k property & equipment damage	* No community notification. * Isolated and short term complaints from neighbors (e.g. complaints about specific noise episode). * Code of Conduct violation that does not lead to higher severity level consequence.	Events of this severity shall be investigated at a level deemed appropriate by the entity's PETROJET leader. RCA is recommended, but a less rigorous approach is acceptable depending on the nature of the incident.

Appendix 3 a) **Comprehensive List Of CAUSES (CLC)**



Toxic Substances[1]				
Substance Class	Lower Toxicity Substance (Class D)	Medium Toxicity Substance (Class C)	Higher Toxicity Substance (Class B)	Acutely Toxic Substance (Class A)
	All gas, vapor, mist or aerosol LOPC, regardless of location			
Level A-D	> 4000 kgs	> 2000 kgs	> 1000 kgs	> 50 kgs
Level E	2000 < 4000 kgs	1000 < 2000 kgs	250 < 1000 kgs	15 < 50 kgs
Level F	200 < 2000 kgs	100 < 1000 kgs	25 < 250 kgs	5.0 kg < 15 kgs
Level G	50 < 200 kgs	25 < 100 kgs	5 < 25 kgs	0.5 < 5.0 kgs
Level H	< 50 kgs	< 25 kgs	< 5 kgs	< 0.5 kgs

Incident Investigation

26.2 Nonconformity, corrective action and preventive action

26.2.1: PURPOSE

This procedure aims to define the responsibilities & proper modules to launch corrective action process in order to investigate the root causes of non conformities affecting the HSEMS Systems resulting in customer dissatisfaction, non conforming service or other deficiencies in the conduct of PETROJET products and services. The procedure also aims to implement a system of follow-up & evaluation of the corrective action's efficiency & adequacy in order to secure a close out of a loophole in the process.

26.2.2: SCOPE

- Applicable to all deficient processes, aspects concerning environmental, hazards internal problems or customer complaints that have warranted the issuance of a formal Corrective Action Request.

26.2.3 : References

- 26.2.3.1 : ISO 9001-2000- 8.5.3
- 26.2.3.2: OHSAS 18001:2007.
- 26.2.3.3: ISO 14001:2004.
- 26.2.3.4: PETROJET Quality Manual.

26.2.4: Definition

26.2.4.1: CORRECTIVE ACTION

- Is an action aiming to treat non-conformity by investigating its root causes in order to prevent its recurrence.

26.2.4.2: PREVENTIVE ACTION

Is an action aiming to eliminate or reduce causes of potential non-conformance or deficiencies in the different processes in order to avoid any undesired situation and prevent the occurrence of an incident or accidents that may jeopardize the HSEMS System & in turn the Quality of the service provided.

26.2.4.3: REPETITIVE NON CONFORMANCE

Is a repeated non-conformance occurring in the same process, by the same Department and/or Division attributed to the same reasons within a period of 3 months?

26.2.5: Procedures and Responsibilities.

26.2.5.1: Procedures and responsibilities of Corrective Action.

Preventive Action may be generated by the following categories:

- Corrective action situations.
- Preventive maintenance.
- Training.
- Measurement & analysis.
- Incident and Accident Investigation result.

Corrective Action Request may be used in cases of preventive measures.

The following is a detailed description of these categories:

26.2.5.1.1: Corrective Action Request may be generated by:

-The Department Responsible and/or Division Headif & when they identify a deficiency that impacts the HSEMS system of the service. Such a request is addressed to the concerned subordinate to implement a course of action with a copy to the HSEMS Department to initiate the follow-up & the verification of the effectiveness of the corrective action

26.2.5.1.2 : Preventive Maintenance

The Maintenance Division Head and/or the Maintenance Manager are responsible for planning & implementing preventive maintenance.

Preventive maintenance shall ***as a minimum requirement*** include all vehicles and equipments critical for ensuring the Quality of the processes outcomes, i.e. service provision.

26.2.5.2: Corrective action request & Follow-Up

26.2.5.2.1: A Corrective Action Request will be issued by the above mentioned responsibilities as a result of:

- Findings of non-conformities by internal or external audits for environmental systems.
- Results of self measurement, process & performance measurement for HSEMS. (All divisions)
- Output from Management Review Meetings.
- Daily and quarter inspection.
- Emergency Equipment Check List.

26.2.5.2.2: A Corrective Action Request will be addressed to the concerned Department Responsible and/or Division Head (with a copy to the HSE Management Representative in case his department is not the issuing department).

Non conformity investigation to identify the type of corrective action required must be conducted by the concerned Department Responsible and/or Head of Division within 1 weeks of the date of the initiation of the request.

26.2.5.2.3: The response of the concerned Department Responsible and/or Division Head will show:

- The root cause of the non conformity.
- The risk assessment for corrective action taken ,
- The immediate corrective measures undertaken to remedy the situation.
- The deadline of the full execution of the corrective action.
- Any long term preventive action to guarantee the non-recurrence of the non conformity (if needed)

Internal auditors will conduct the proper verification to ensure the realization of the corrective action within the allotted time.

26.2.5.2.4: Every corrective action will be registered by the HSE Team in the Corrective/Preventive Action Follow-up–which will show:

- The nature & cause of the non-conformity
- The type of action required (Preventive or Corrective)
- The aspect assessment for the corrective action taken.
- The name of the concerned responsible habilitated to treat the non- conformity & the deadline of completion of the corrective measures.
- The date of verification of the execution of the corrective action & the name of the internal auditor charged with the verification process.
- The date of verification and risk assessment of the effectiveness of the corrective measures- which may be conducted at a sufficient interval of time to properly asses its impact- and the internal auditor in charge.

26.2.5.2.5: If the response of the Department/Division is unacceptable, it will be returned to the person who authorized the corrective action along with a justification of the inadequacy of the measures taken. An updated feed back on a more suitable corrective plan must be represented within a week.

26.2.5.2.6: Corrective actions are summarized and illustrated to the top management during the periodical Management Review sessions.

26.2.5.2.7: Records of the Corrective Action Request, the Corrective Action log & the concerned department's feedback will be kept at the archives of the HSE Department for 5 years .

6.2.5.3: Procedures and responsibilities of preventive action.

26.2.5.3.1: GENERAL

Preventive Action may be generated by the following categories:

- Corrective action situations.
- Preventive maintenance.
- Training.
- Measurement & analysis.

Corrective Action Request may be used in cases of preventive measures.
The following is a detailed description of these categories:

5.3.2: Corrective Action

An integral part of any corrective measure is the elimination of the root causes of deficiencies. Therefore, Preventive Action is a possibility at each situation where deficiencies are detected even if they, i.e. the deficiencies, had already impacted the service provision process or environmental.
Preventive action may also be needed in the following cases:
- Internal: an internal process that needs to be re-assessed to prevent any potential but predictable impact on the service provision and environmental performance)

26.2.5.3.3: Preventive Maintenance

The Maintenance Division Head and/or the Maintenance Manager are responsible for planning & implementing preventive maintenance.
Preventive maintenance shall as a minimum requirement include all vehicles and equipments critical for ensuring the Quality of the processes outcomes, i.e. service provision.

26.2.5.3.4: Training

Training procedure will identify training needs for key persons whose performance impact the service provision and environmental performance & its quality in order to equip each employee with the necessary skills for a successful performance thus largely preventing/minimizing any possible causes of deficiencies in the conduct of processes.

26.2.5.3.5: Measurement & Analysis

- Where appropriate, each Division and/or Department will develop its own measuring & monitoring processes to assess the Quality of its processes & and it's Impact to Environment , will then undertake preventive measures based on the trends shown by the data collected as well as by the data submitted by analysis & Reports.

- Each Division Head and/or Department Manager is responsible for documenting the preventive action being undertaken and ensuring their effectiveness.

26.2.6.0: Measurement of Effectiveness (M.O.E)

The effectiveness of the application of the procedure is measured by:

- The number of Corrective Action Requests initiated.
- The rate of recurrence of non-conformities that have been subject to corrective action.
- The completion or non completion of the cycle of follow-up in the determined span of time. .

- Incident and accident rate.
- The number of Preventive Action initiated.
- The condition of our equipment: maintenance, washing, etc…
- Customer satisfaction & the recurrence of customer complaints.
- The quality level in the performance of the different processes.

27.Structure and Responsibility

PJ - HSEMSP 4.4.1

27.1 Purpose

27.1.1 To define, document and communicate Resource, Roles, Responsibility, Accountability and Authority to facilitate effective health, safety and management

27.1.2 To define systems those allocate resources essential to the implementation and control of Health, Safety Management Systems.

27.1.3 To define the HSE management representative who, with regard to occupational health & safety management, have responsibility and authority for:

- Ensuring that HSE management system requirements are established, implemented and maintained according to internal and external standards.
- Reporting on the performance of the HSE management system to senior management for review and as a basis for improvement of the HSE management system.

27.2 Scope

PETROJET Sites

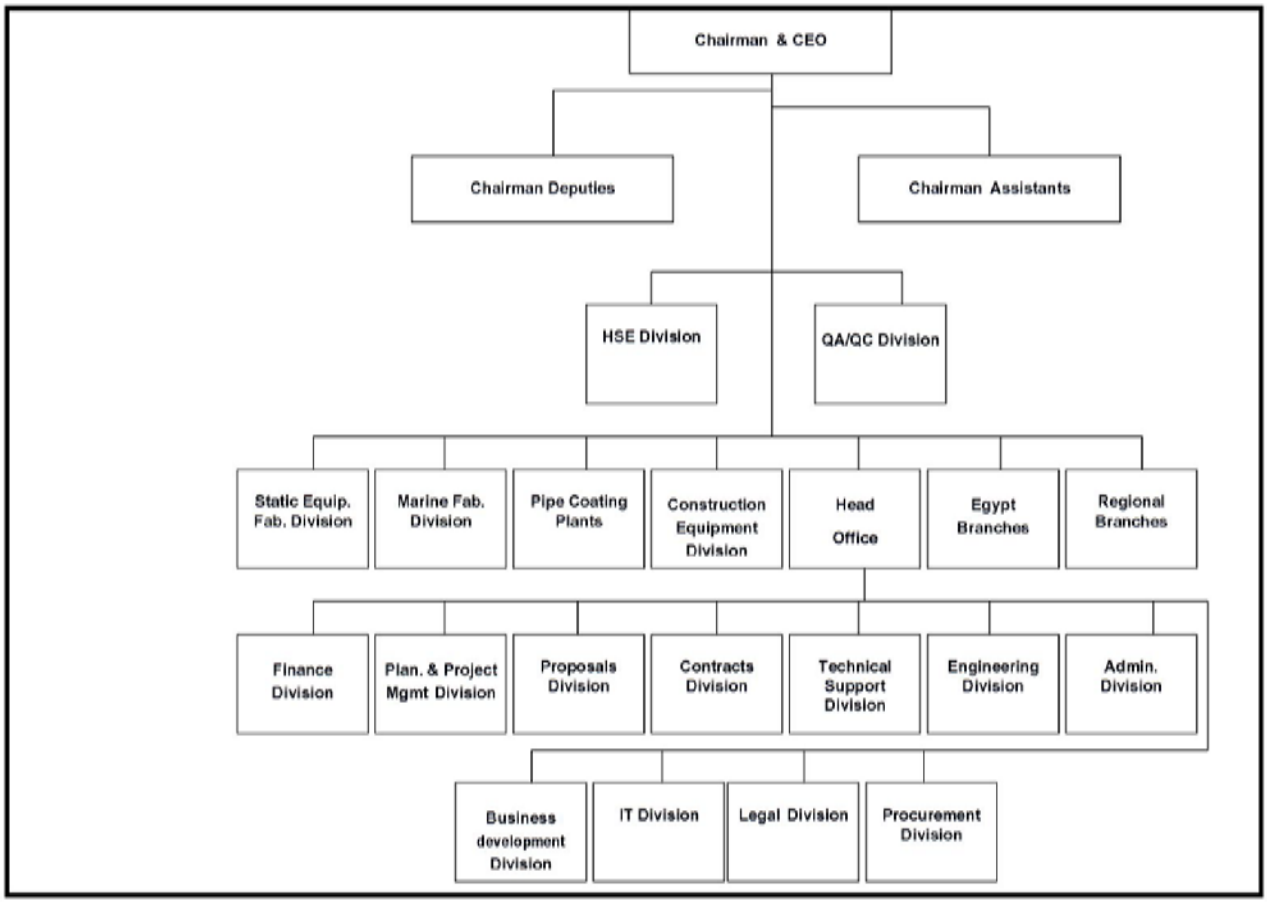
27.3 References

27.3.1: ISO 14001
27.3.2: OHSAS 18001

Definitions

Resources: - Include human resources and specialized skills, technology and financial resources.

27.4. Structure Diagram



27.5 PROCEDURES

27.5.1 Defined roles, responsibilities and authorities for health, safety management are documented within appropriate organization charts.

27.5.2 Defined health, safety and roles and responsibilities and authorities shall be communicated in accordance with Communication & Consultation Procedure.

27.5.3 Effective health, safety management are facilitated through Health, Safety Committee Meetings in accordance with:-
- Health, Safety Committee Constitution

27.5.4 Specific roles, responsibilities and authorities for health, safety management are defined below:-

Role	Responsibilities
Chairman & CEO	- Review & approve corporate HSE Policy and Commitment. - Approve the annual Corporate HSE Plan. - Communicate HSE issues to staff (e.g. bulletins, news, flashes, letters, forwards in plans, etc). - Ensure that HSE-MS is managed in a structured manner throughout the company through the HSE Steering Committee. - Provide assurance to stakeholders (via annual HSE letter) of structured HSE management and compliance. - Ensure sufficient resources are available to support the implementation of the HSE-MS. - Review suitability & effectiveness of the HSE-MS. - Monitor Corporate HSE Performance. - Lead Crisis Management Team.
HSE GM	- Establish strategic corporate objectives for HSE. - Support & monitor the implementation, performance and effectiveness of the Asset Integrity Management systems. - Appoint Technical Authorities for Procedures and Standards (through Capability Coordinators) - Review incidents with significant actual or potential consequence. - Review Contractor HSE Performance. -

	- Ensure that external affairs, related to HSE issues, are managed with - appropriate liaison with government and community, especially for Crisis Management. - Ensure line HSE responsibilities and commitments are carried out. - Ensure that HR Policies & Practices are established and practised. - Ensure that appropriate medical services are provided and properly staffed. - As chairman of the tender board, ensure that HSE requirements are not being compromised during the contract award process. -
Medical Department General Manager	- Provide advice on Occupational Health policies, objectives, targets and standards. - Provide specialist services to assist the line in fulfilling their OH responsibilities. - Ensure that Minimum Health Management Standards are disseminated and applied throughout the company. - Provide guidance on Human Factors Engineering.
Branches/General Departments /Projects Managers	- Define roles, responsibilities, authority and provide resources for ensuring that Corporate HSE-MS requirements are implemented and maintained in all locations and their areas of operation.(e.g. via local HSE-MS, HSE Case, and/or bridging documents) - Approve annual HSE Plan, departmental aspect registers. - Conduct regular reviews of the HSE management system to ensure its continuing suitability, adequacy and effectiveness. - Identify the HSE-Critical Activities within their area and develop strategy for control of identified hazards. - Identify all HSE-Critical Activities associated with their facilities / operations and assign ownership of these. - Ensure that HSE responsibilities of all staff are fully embedded in their Job Descriptions. - Review and approve HSE Cases for all major facilities and environmental management manual. - Ensure that review of all significant incidents (incl. near-misses) is conducted. - Ensure that contractor HSE performance reviews of all major contracts are completed. - Appoint an Environmental Management - Ensure that there is sufficient staffing for HSE-Critical Roles together with appropriate training and competencies. - Lead Emergency Co-Ordination teams as Emergency Co-coordinator (EC).

Finance Department General Manager	- Ensure securities are managed systematically in the company - Ensure line HSE responsibilities and commitments are understood and applied. - Ensure that HSE management is integrated into contract services and processes.
Information Technology Manager	- Ensure line HSE responsibilities and commitments are understood and applied. - Provide resource and guidance for managing company records. - Ensure that IT (data & telecomm) services are managed with sufficient reliability especially for emergency response. -
Head of Planning & Project Management	- Ensure that the HSE-Critical Activities are included in the Business Process Model data base. - Integrate HSE planning process with company business plan delivery.
Head of Legal Affairs	- Ensure knowledge and dissemination of legislation requirements impacting on HSE matters and advise the organisation accordingly; - Maintain a list/register of HSE related regulations which apply to PETROJET. -
Supervisors	- Read the HSE Policy and understand my HSE responsibilities. - Set good example for my team by working safely following the “Golden Rules” and Procedures. - Make my team members aware of their responsibilities, and the importance of following the “Golden Rules”, Procedures and Work Instructions. - Participate in HSE meetings and take every opportunity to talk to my team about HSE issues. - Regularly check HSE training compliance with the Mandatory Training Matrix. - Focus attention on supervising the most hazardous activities - Make sure my team members follow the job safety plans and Permit to Work requirements. - Understand my role in the event of an emergency and participate in emergency drills and exercises. - Support my team to achieve their ‘Tasks and Targets’. - Check that HSE controls are in place before any activities are carried out by my team, and stop any operations where they are not in place. - Notify and report and follow-up on HSE incidents, near misses and non-compliances. - Provide accurate information to audit teams. - Implement PTW audits. - Ensure all corrective actions assigned to my team arising from audits, incidents and HSE reviews are implemented on time. -

Employees and Contractors	- Read the HSE Policy and understand my HSE responsibilities. - Follow the "Golden Rules", Procedures and Work instructions. - Complete HSE training for which I have been nominated. - Familiarise myself with the hazards associated with my work prior to commencement of the work. - Attend toolbox talks. - Do not start, and stop, any activity if I believe it cannot be done safely, or it fails to meet our environmental and health standards. - Follow the job safety plans and requirements laid down in the Permit to Work form. - Know my 'Tasks and Targets' and strive to meet them. - Understand my role in the event of an emergency. - Keep my workplace tidy and free of obstructions. - Notify my supervisor immediately about all HSE incidents, near misses and non-compliances. - Provide accurate information to audit teams. - Ensure all corrective actions assigned to my team arising from audits, incidents and HSE reviews are implemented on time.

28.Communication, Participation and Consultation

PJ - HSEMSP 4.4.3

28.1 Purpose.

To define internal communication among company's different activities and departments regarding HSE objectives & Management System.

To state External communication method with external authorities, aiming at solving HSE problems.

To consulate with the interested parties and contractors about HSE matters.

To ensure employee's involvement and consultation arrangements in HSE System.

TO ensure the participation of workers in hazard identification , risk assessment , determination of controls , accident investigation and reviewing of policies and objectives

28.2 Scope.

All Internal & External Communication, consultation and participation concerning HSE matters and Management System.

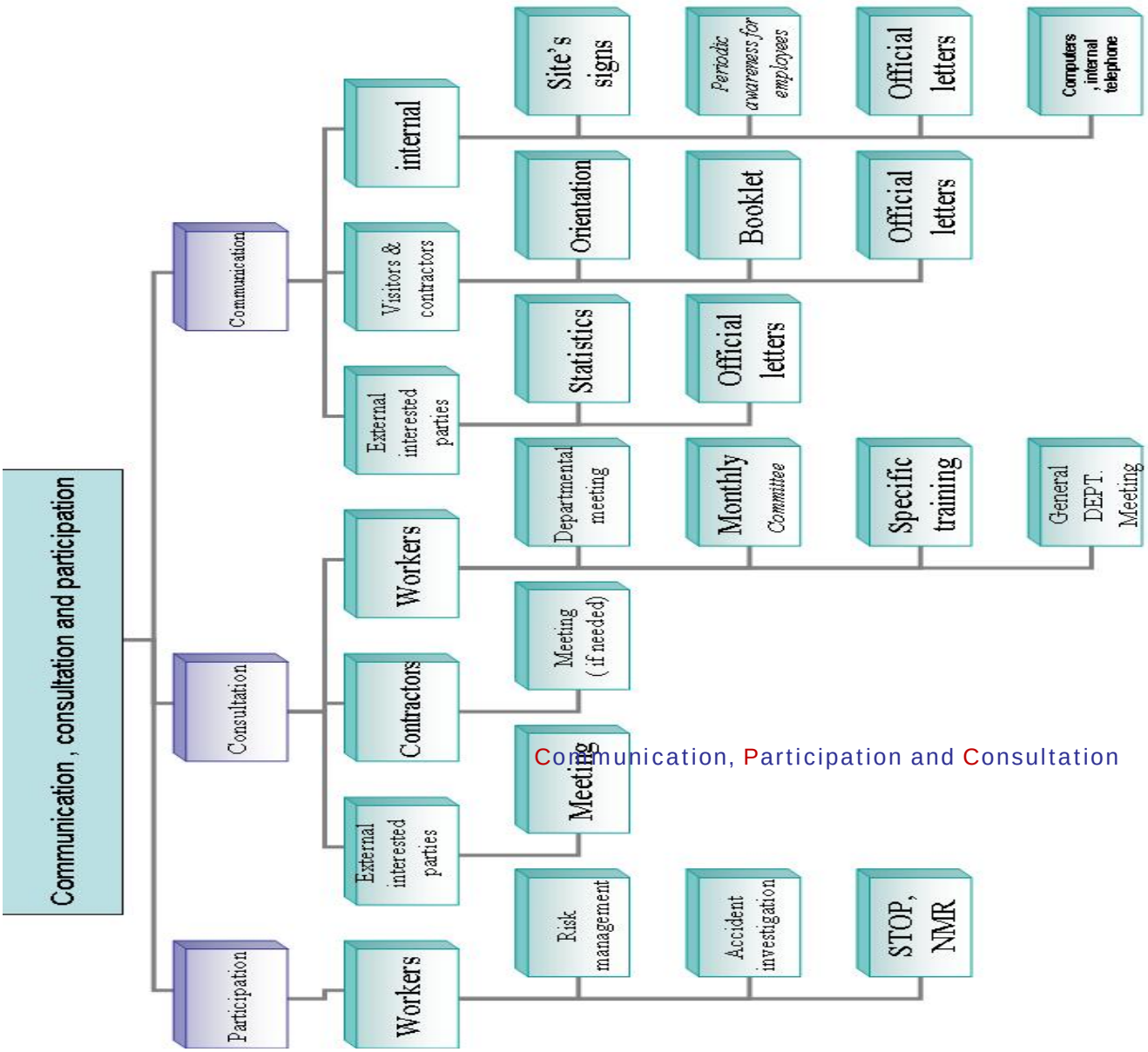
28.3 References.

28.3.1: ISO 14001
28.3.2: OHSAS 18001

28.4 Definitions.

None.

28.5 Consultation, Communication and participation diagram



28.6 Procedure and responsibilities.

28.6.1 internal communications:-

28.6.1.1 Signs

1) Petrojet provide HSE signs for all sites belongs to petrojet in accordance with OSHA (three categories)
2) Poster campaigns in all sites inviting the employees have a positive behavior and self responsibility towards the HSE

28.6.1.2 Periodic awareness for employees:

1) Internal awareness (on job training) to all of the company's employees (including site visits).
2) Periodical participation in HSE conferences.

28.6.1.3 Official letters:

According to petrojet structure

28.6.1.4 Internal Telephone & Computers Networks:

1 PETROJET Staff have access to these networks which offer additional HSE information & facilitate the communication between them.
2 Periodical HSE information pack (prepared and reviewed by HSE) is shared on the network, stating recent incidents of near-misses, including lessons learned direct & underlying causes, plus other general HSE information.

28.6.2 visitors& contractors communications

- All Petrojet's sites provide a booklets for all visitors and contractors which enter the site describing site emergency plan, musters points , emergency telephones…etc)
- A HSE orientation should be held for all visitors and subcontractors

28.6.3 external interested parties communications:-

- Ongoing contact with the EGPC concerning any HSE issue regarding our activities.
- Semi annually Accident/Illness Report to the Authority HSE Office.

28.6.4 workers consultations:-

28.6.4.1 Departments' periodical HSE Meeting:

1 Conducted by the Division Head.
2 Review current HSE performance, within the division, and take corrective action.
3 Define roles, responsibilities, authority within the division.
4 Ensure all corrective actions assigned to their staff arising from audits, incidents and HSE reviews are implemented on time.

28.6.4.2 HSE Committee's Periodical Meeting:

1 Seek co-operation from all staff in promoting HSE.
2 Monitor implementation of follow up measures to prevent incidents

occurrence and their ongoing adherence.

3 Approve the meeting minutes and follow up agreed actions.

4 Monitor status with action follow up.

5 Advise on HSE training, instructions and guidance of workers.

6 Review learning points from incidents.

28.6.4.3 Specific training

For future information see PJ-HSEMSP-4.4.2

28.6.4.4 General department meeting

A periodical HSE meeting with a participation of all petrojetHSE managers and leading this meeting HSE GM.

28.6.5 Contractors meeting:-

Consultation is disseminated to contractor staff by means of:-
Regular meetings between Contract Holders and their respective Contractors.

28.6.6 external interested parties meeting:-

Periodical meetings with the delegating authority.

28.6.7workers participation:-

Petrojet encourage workers in participation in HSE matters by:
involving them in preparing risk assessment for them activities & review the existing control measures
involving workers in accident investigation to obtain root causes and lesson learned
Initiate programmes such as STOP, NMR and encourage workers participation by incentives

29.Evaluation of Compliance

PJ - HSEMSP 4.5.2

29.1 Purpose

To evaluate compliance with applicable legal & other requirements relevant to HSE Hazard resulting from company's activities.

29.2 Scope

All company's activities which interact with Occupational Health and safety.

29.3 References

29.3.1: OHSAS 18001: 2007
29.3.2: ISO 14001: 2004

29.4 Definitions

None.

29.5 Procedure and Responsibilities

29.5.1 Sources of the commitment toward HSE Management System :

- Egyptian regulation and legislation related to company's activity.
- Requirements of Private Contract's client.

29.5.2 Identifying and accessing the up-dated versions of the Regulations & Legislations and other HSE requirements that are applicable to the company's activities.

29.5.3 Monitoring and Measurement Plan for evaluating the compliance with applicable legal & other requirements is placed on regular periodic basis and has to signed by HSE Management Representative.

29.5.4 For each Site/ Area/Department the Evaluation records of Compliance with HSE Regulations are maintained also on regular periodic basis.

29.5.5 In case of developing or new projects or activities, a discussion between Concerned Division Head &HSE Management Representative must be taken to verify its compliance with HSE Regulations & Legislations & other requirements.

30. Competence, Training and Awareness

PJ - HSEMSP 4.4.2

30.1 PURPOSE

The purpose of the document is to provide a consistent and effective HSE induction and training procedure.

30.2 SCOPE

This Procedure is applicable to all situations where Petrojet Management is responsible for the implementation of a HSE Management System at site.

30.3 RESPONSIBILITY

The General Manager (each branch/department) is responsible for its authorization and implementation in co-ordination with the HSE General Manager.

30.4 APPROACH

30. 4.1 NEW EMPLOYEE HSE ORIENTATION

30. 4.1.1 General Orientation

Each employee hired to work in Petrojet sites will receive a HSE orientation, which shall include the following:

- Local HSE regulations that apply
- Basic Site HSE rules
- Hazard communication program
- Site Emergency Preparedness Plan

Each new employee shall be provided a copy of the information package presented at the orientation and be given sufficient time to review its contents.

A designated person(s) (HSE trainer & responsible manager) shall verbally review the orientation with the new employees and give said employees a chance to question items they do not understand

A small quiz will be held to the new employee by HSE trainer to demonstrate his knowledge towards HSE and his ability to do his job (if he fails in the exam, so he is not allowed to work in petrojet's site)

At the end of the orientation each new employee shall sign and date an acknowledgement sheet stating they received a copy of the subject matter presented, that they were given a chance to question its contents and that they understand their responsibility in regards to HSE. The signed acknowledgement shall be placed in each employee's personnel folder.

An ID photograph (HSE ID Card) will be issued to the employee after the attendance of the Company HSE Induction. The same card shall be used to record any further HSE Initial or Refresher training that is required to be given in accordance with PetrojetHSE Training Standard Matrix.

30.4.1.2 Departmental HSE Orientation

Each Line Manager orientates its new employees assigned to their department in rules and regulations specific to their type of work activities.

Line Managers shall document the contents of their orientation and furnish copies to the HSE Department.

Line Managers shall keep attendance records of said HSE Orientations.

30.4.2 HAZARD COMMUNICATION

All employees will receive training about hazardous chemicals they use or may be exposed to during the course of their jobs.
This training should be done at the same time as the "New Employee HSE Orientation." Furthermore, initial and refresher training shall be done in accordance with the Training Standard Matrix, PJ-HSEMSF-4.4.2-01

Records of training shall be kept at the HSE Office.

30.4.3 TRAINING FOR SPECIFIC OPERATIONS /ACTIVITIES AND DISCIPLINES

Specific HSE Training is mandatory and shall be conducted in accordance with the Training Standard Matrix. PJ-HSEMSF-4.4.2-01 otherwise an external HSE training exist and according to plan.

Written records must be maintained documenting all training performed during the contract of personnel. These records must be maintained by the HSE Department till the end of the individual contract and then transferred to the Archiving Unit for retention as per the Record Management procedure.

All training noted above shall be conducted by a competent person designated and approved of the HSEASS. General Manager.

In addition someone will also need to be in control of the toolbox talk/ pre-job meeting to ensure all personnel are aware of the task, the documented procedures to be followed and their responsibilities.