

CONFINED SPACE ENTRY PROCEDURE

AGREEMENT NO. : 09-5578-E-4

PROJECT NAME : Ruwais Refinery Expansion Project
EPC-4: Tankage & Associated
Interconnecting Piping


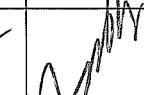

COMPANY : Abu Dhabi Oil Refining Company (TAKREER)

PMC : Mott MacDonald Ltd.

CONTRACTOR : Daewoo Engineering & Construction Co., Ltd.

TAKREER	RUWAIS REFINERY EXPANSION PROJECT	DAEWOO E&C	
	EPC-4 TANKAGE AND ASSOCIATED INTERCONNECTING PIPING		
	AGREEMENT No. 09-5578-E-4		
PROJECT No. 5578	Doc. No. 5578-E4-HSE-HU-00015	Rev. 0	Page 2 / 27

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						DIST. CODE	18/19
O	16 August 10	Issued for Construction	C Wardman	DY Kim	J Brand	M Heo	
A	16 July 10	For Review & Comment	C Wardman	DY Kim	J Brand	M Heo	
REV	DATE	REASON FOR ISSUE	PREP	CHKD	REVD	APP'D	COMPANY
SIGNED (Initials)							

NOTES:

- (a) Revisions are denoted by a vertical line placed in the right-hand margin against the revised text.
- (b) PREP = Prepared by, CHKD = Checked by, REVD = Reviewed by, APP'D = Approved by.
- (c) In case of conflict between any requirements stipulated in this document with the contractual requirements, the contractual requirements shall prevail.

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1. INTRODUCTION

1.1 Purpose

The purpose of this procedure is to ensure all work associated with entry into confined spaces is carried out in a safe and efficient manner and provides necessary safeguards for personnel engaged to carry out such works at the worksite.

1.2 Scope

The scope of this procedure extends to all areas of the Ruwais Refinery Expansion Project – EPC 4 worksite where any confined space activities are to be performed.

2. DEFINITIONS

2.1 Confined Space

Confined Space means any enclosed or partially enclosed space located either above or below ground or deck level where entry is possible and where there is a risk of oxygen deficiency/enrichment, or the accumulation of dust or gases which are flammable or hazardous to a person(s) health. Entry into these, or any other confined spaces refers not only to complete body entry but also to partial entry when the head is inserted into the confined space via a manhole or opening.

Three criteria needed to define a confined space are:

- Large enough to bodily enter and perform work, and
- Has limited or restricted access or egress, and
- Not designed for continuous human occupancy

Some examples of confined spaces, which may be applicable, are:

Process Columns, Vessels, Exchangers and Equipment Skirts

- Larger Diameter Piping
- CO2 Compartments
- Underground Collection Pits
- Sewage Pits

2.2 Intrinsically Safe

Intrinsically Safe is an attribute applied to electrical equipment that is designated for use in explosion-prone areas.

In normal uses, electrical equipment often creates internal tiny sparks in switches, motor brushes, connectors, and in other places. Such sparks can ignite flammable substances present in air. A device termed *intrinsically safe* has been certified by a recognized agency as safe to operate in a hazardous atmosphere as indicated by the certification.

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3. HAZARD CONTROL MEASURES

3.1 General

Entry into a confined space for any purpose shall only be as a result of all other practical means of resolving the problem being exhausted and or deemed impractical.

3.2 Written Policy/Procedures

CONTRACTOR and its subcontractors shall maintain a system of authority and responsibility for establishing written procedures covering work in confined spaces in order to:

- Understand the Confined Space entry permit system
- Familiarize personnel with the hazards that may be present in confined spaces
- Train personnel to employ the appropriate safeguards for controlling such hazards
- Train personnel in the use of test equipment for monitoring those hazards
- Ensure the provision of qualified and authorized supervision of work in confined spaces to ensure that work is conducted safely
- Establish emergency plans with the appropriate level of training including emergency rescue, injury management, basic first aid and use of self contained breathing apparatus
- Audit and verify subcontractor's compliance with the provisions of the CONTRACTOR confined space entry procedures.

The Contractor HSE Manager and Subcontractors' HSE Managers will verify compliance with the project's confined spaces procedure and the associated training requirements discussed in Section 4.

3.3 Comprehensive Program for Project

CONTRACTOR shall inform employees that the workplace contains confined -spaces and that confined space entry is allowed only through compliance with the project's written Confined Space Procedure and Permit to Work Procedure.

3.4 Confined Space Entry

- Whenever CONTRACTOR and its Subcontractors personnel will enter a specific permit-required confined space, CONTRACTOR shall:
 - Apprise the Job Supervisor of the elements, including the hazards identified and the CONTRACTOR's experience with the space, that make the space in question a confined space
- Apprise the Job Supervisor of any precautions or procedures that CONTRACTOR has implemented for the protection of employees in or near confined spaces where personnel will be working
- Coordinate entry operations with the Supervisor, when both CONTRACTOR personnel and COMPANY and/or other Subcontractor personnel will be working in or near Confined Spaces
- Debrief the Supervisor and/or other CONTRACTOR personnel on any hazards confronted or created in the confined space during the entry operations.
- Job Supervisor

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Whenever personnel must enter a specific permit required confined space, the Job Supervisor shall:

- Obtain any available information regarding confined space hazards and entry operations from COMPANY;
- Coordinate entry operations with COMPANY, when CONTRACTOR, COMPANY and/or other Subcontractor personnel will be working in or near Confined Spaces
- Inform client of the Confined Space Program that CONTRACTOR will follow and of any hazards confronted or created in Confined Spaces, either through a debriefing or during the entry operation.

3.5 Warning Signs

The Job Supervisor shall insure that an appropriate warning sign has been located near all entrances into a confined space prior to starting work. The warning signs shall remain in place until the work activities are completed and while any normally closed entrances are open. The recommended wording for the warning signs is:



4. TRAINING

The employee site orientation training provided to each employee upon initial assignment to a job site shall include sufficient instruction to prevent unauthorized entry into a confined space.

Employees prior to, initial assignment as an Entrant, Attendant, and Rescuer shall successfully complete a formal classroom training session and/or Job Supervisor for confined space operations.

- Training content shall include the following:
- Site-specific, written Confined Space Procedure, and
- General duties of Job Supervisor, Authorized Entrants, Attendants, and Rescuer
- Refresher training shall be completed on an annual basis.
- The training shall establish employee proficiency in their required duties and shall introduce new or revised procedures, as necessary. Each training session shall be accurately documented.

The CONTRACTOR HSE Manager in conjunction with the Subcontractor's Safety Manager will establish the training requirements for all personnel required to either perform or support confined space work activities.

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Training will be based on both theory and practical sessions and all training will be documented by having the participants complete a confined space knowledge test and sign an attendance register.

5. RESPONSIBILITIES

5.1 Project Manager

- Has the final responsibility to ensuring that Confined space work on the project is done without endangering health and safety in accordance with the local legislation, client's requirements and stipulations laid down in the HSE management system document
- Reviews and approves procurement requisitions: carries out checks and inspections to ensure that delivered goods used for confined space are of good quality in respect of health and safety
- Ensure that accidents are reported, investigated and that corrective and preventive measures are taken: joins the accident investigation team
- Has the power to stop any work or operation under his authority on health, safety or environmental grounds until effective measures have been taken
- Has the power to remove personnel, including sub-contractor's personnel from the project site if despite repeated warnings (including written warning), they work in a manner which endangers health or safety

5.2 HSE Manager

- Shall coordinate with the section managers to ensure that suitable arrangements, including subcontractors, are in place to conduct the confined space work safely
- Shall assign HSE personnel for performing internal audits, advising employees on subjects concerning health and safety
- Ensure that necessary work permits and check lists are in place and duly completed before entering.
- Ensure that the gas test is completed and the atmosphere inside the confined space is safe to enter and perform the activity, and the necessary records are in place.
- Ensure that the crews working inside are adequately trained with the danger of confined space, and to meet the emergencies.

5.3 Section Manager

- Ensure that work on the project site is carried out without endangering health and safety in accordance with the HSE plan and procedures
- Give his staff members job-related information and instructions on the subject of health and safety and repeats such information and instructions as needed
- Conducts audits checks on plant and equipment prior to commencement of work
- Ensures that all employees receive PPE and sees to it that they use them where necessary and maintain them correctly

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- Makes inventory of potential hazards, takes corrective and preventive actions, ensures that the Site HSE Officer records these to the Project Manager
- Is authorized, if he is of the opinion that there is a threat of immediate and serious danger, to stop any activity under his authority from being carried out and/or stop the use of plant and equipment, machinery, etc. until effective measures have been taken
- Ensures that the PTW (Permit to Work) is validated daily

5.4 Job Supervisor Duties

- Know the hazards that may be faced during entry, including information on the mode, signs, or symptoms, and consequences of the exposure;
- Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- Terminate the entry and cancel the permit when either the entry operations covered by the entry permit have been completed or a condition that is not allowed under the entry permit arises in or near the confined space;
- Verify that rescue services are available and that the means for summoning them are operable;
- Prevent unauthorized individuals to enter or attempt to enter the confined space during entry operations; and
- Determine, whenever responsibility for a confined space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.
- Complete Check Lists provided in Attachments 1 and 2, then sign.

5.5 Authorized Entrants Duties (employees who have attended the CSE Training)

- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Know how to properly use the equipment, including PPE, required for the work.
- Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space immediately under any of the following conditions.
 - If the attendant detects a prohibited condition;
 - If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;
 - If the attendant detects a situation outside the space that could endanger the authorized entrants; or
 - If the Attendant cannot effectively and safely perform all the required duties and responsibilities.

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- Alert the attendant whenever:
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or
 - The entrant detects a prohibited condition.
- Exit from the confined space as quickly as possible whenever:
 - An order to evacuate is given by the attendant or the Job Supervisor,
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation,
 - The entrant detects a prohibited condition, or
 - An evacuation alarm is activated.
 - When using a breathing apparatus review the Breathing Apparatus Check List, Attachment 2, with Job Supervisor and Attendant and sign.
 - Review Attendant/Entrant Check List, Attachment 3 and sign.

5.6 Attendant / Hole watch Duties

- All Attendant Hole watch will be adequately qualified via DEC Hole watch training and follow up supervisor directed training on the job.
- Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Know the possible hazard exposure behavior effects, which may be experienced by the authorized entrants.
- Continuously maintain an accurate count of authorized entrants in the confined space and ensure that the means used to identify authorized Entrants accurately identifies who is in the confined space.
- Remain outside the confined space during entry operations until relieved by another attendant; (Note: When the employers permit entry program allows attendant entry for rescue, attendants may enter a confined space to attempt a rescue if they have been trained and equipped for rescue operations and if they have been relieved by another Attendant).
- Establish and maintain continuous contact (visually verbally, whistle, tag line, etc.) with entrants. This contact is required to monitor entrant status and to alert entrants of the need to evaluate the space.
- Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from confined space hazards. The communication will be by radio, which will be in direct contact with the CONTRACTOR HSE Manager, Site Rescue Team and Nurse.

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- Take the following actions when unauthorized persons approach or enter a restricted area while entry is underway
 - Warn the unauthorized persons that they must stay away from the confined space restricted area;
 - Advise the unauthorized persons that they must exit immediately if they have entered the area; and
 - Inform the authorized entrants and the Job Supervisor if unauthorized persons have entered the confined space restricted area.
- Perform non-entry rescues as specified by the employer's rescue procedure.
- Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the confined space immediately under any of the following conditions:
 - If the attendant detects a prohibited condition;
 - If the attendant detects a situation outside the space that could endanger the authorized entrants;
 - If the attendant detects the behavioral effects of hazard exposure in an authorized entrant; or
 - If the attendant cannot effectively and safely perform all the above duties.
- Perform no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.
- When self contained breath apparatus (SCBA) is in use, the Attendant shall verify with the wearer that:
 - The pressure (content) of the bottle(s) on entry complies with at least 90% of the maximum working pressure.
 - The equipment's low-pressure alarm is functional.
 - The facemask fits correctly.
 - The operating time is calculated agreed and monitored.
 - Attachment 2 is signed by Job Supervisor, Entrant and Attendant.
- When non self-contained breathing apparatus is in use, a separate attendant must be available to ensure that: The air supply from the outside is maintained and safeguarded against contamination.
- Review Attendant/Entrant Check List, Attachment 3 and sign.

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5.7 Rescue and Emergency Services

- The following requirements apply to employers who have employees enter confined spaces to perform rescue services.
- The employer shall ensure that each member of the rescue service is provided with, and is trained to use properly, the personal protective equipment and rescue equipment necessary for making rescues from confined spaces.
- Each member of the rescue service will be adequately qualified through a third part training course in Confined Space Rescue.
- Each member of the rescue service shall practice making confined space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, mannequins, or actual persons from the actual confined spaces or from representative confined spaces. Representative confined space shall, with respect to opening size, configuration, and accessibility, simulate the types of confined spaces from which rescue are to be performed.
- Each member of the rescue service shall be trained in basic first aid and cardiopulmonary resuscitation (CPR). At least one member of the rescue service should have current certification in first aid and in CPR.
- When an employer (host employer) arranges to have persons other than the host employer's employees perform confined space rescue, the host employer shall:
- Inform the rescue service of the hazards they may confront when called on to perform rescue at the employer's facility, and
- Provide the rescue service with access to all confined spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.
- To facilitate non-entry rescue retrieval, systems or methods shall be used whenever an authorized entrant enters a confined space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements.
- Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head. Wristlets may be used in lieu of the chest or full body harness, if the employer can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.
- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the confined space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type confined spaces more than 5 feet deep.
- In the event of exposure to certain chemicals, a MSDS – Material Safety Data Sheet for the chemicals present at the confined space location must be posted with the PTW. This will also assist medical services.

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- No one must attempt a rescue without appropriate third party Confined space rescue course and adequate and approved breathing apparatus..

6. HAZARDS ASSOCIATED WITH CONFINED SPACE

Before entering a confined space all identifiable hazards shall be taken into consideration and safeguarded against. These hazards consist of:-

- Oxygen deficiency/enrichment
- Flammability, fire and explosion
- Chemical hazards
- Physical hazards and use of electrical equipment within the confined space
- Access into / egress from confined space
- Other hazards.

CONTRACTOR will conduct a job safety analysis with the group entering any confined space to review the work scope and implement step by step procedures for each task.

7. PERMITS AND REQUIREMENTS

Conditions necessary for safe work in or around a confined space will vary depending on its location, configuration and use. After all potential hazards have been identified using the job safety analysis process the additional safeguards prescribed in this chapter shall be adopted as a minimum requirement.

7.1 Permits (PTW)

Applications for confined space entry permits will be submitted by performing parties to the CONTRACTOR PTW Coordinator at least 24 hours prior to the proposed commencement of the works.

CONTRACTOR can use the client Permit to Work System Procedure or if the client does not have a permit to work system, the CONTRACTOR Permit to Work System can be used.

A copy of the permit will be maintained at the work-site at all times while confined space activities are in progress. These permits will be valid only for one (1) working day and can be extended to the next succeeding shift after thorough checking of the confined space requirements and must be revalidated at the start of each shift.

The supervisor for the Subcontractor and the CONTRACTOR Supervisor will be responsible for ensuring all conditions of the permit are complied with. A confined space entry checklist will also be located at the workplace and will be checked off daily by the CONTRACTOR Supervisor to ensure all safeguards are maintained throughout the duration of the confined space activities.

Once the CONTRACTOR PTW Coordinator or authorized representative is satisfied that all permit requirements have been met, he will issue the permit to the Subcontractor.

7.2 Isolation

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The confined space shall be isolated from all potential dangers such as ingress of fumes etc by positive isolation including blinding, disconnecting or blanking all lines connected to the confined space or by other approved means.

7.3 Ignition Sources

All possible ignition sources shall be removed from the immediate area where the installation or application of flammable or combustible substances is required within the confined space.

7.4 Electrical/Hydraulic Lock Out and Tag Out

Any equipment located within the confined space that is electrically or hydraulically driven shall be de-energized or depressurized and the isolations of such equipment tagged and locked in accordance with the CONTRACTOR RRE Project Lock Out/Tag Out procedure.

7.5 Heat Stress

A system of work that allows personnel relief from working in areas of constant elevated temperatures shall be adopted. In such situations it may be necessary to include in the work process regular work/rest breaks or alternatively have two crews so as to enable the work to proceed with crews alternating.

Where possible the temperature within the confined space should be reduced by means of ventilation or the introduction of cool air.

7.6 Radiation

All sources of radiation will be removed from the area or positively shielded to avoid radioactive contamination of the confined space.

7.7 Testing and Monitoring

All confined spaces will be gas tested prior to entry and at pre-determined intervals. The frequency of such tests shall be documented on the confined space entry permit. Results of such tests will also be documented on the permit. All gas testing will be undertaken by a 3rd party certified Gas Tester who has been trained in the use of such testing equipment and can interpret results correctly.

Tests will be conducted in such a manner that will ensure all areas of the confined space are free of harmful gases and are not oxygen deficient or enriched. Personnel will not be permitted to enter any confined space where the oxygen content is below 19.5% or above 23.5% by volume.

All testing equipment used for confined space monitoring shall be regularly maintained, serviced and calibrated. It must be suitable for the type of test required and of an approved (client) Type.

7.8 Ventilation

Ventilation where necessary will be provided by either natural or mechanical means. In vessels where there has been a presence of hazardous substances, the confined space will be force ventilated for 24 hours prior to entry. All such vessels will be thoroughly examined prior to entry to ensure there is no longer any contamination by the presence of hazardous substances.

7.9 Personal Protective Equipment

All relevant personal protective equipment applicable to the task being performed shall be provided and the wearing of such equipment shall be mandatory. Such equipment shall consist of but may not be limited to the following:-

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- Personal Monitors (e.g. H2S, O2 and Hydrocarbons)
- Safety Helmet
- Safety Spectacles (Clear Type)
- Safety Harness and Lifeline
- Safety Footwear
- Industrial Safety Gloves
- Extraction Fans
- Hearing Protection
- Self Contained Breathing Apparatus (where necessary)
- Other respiratory protective equipment as required.

All tasks shall be completely assessed using the job safety analysis technique prior to commencement. Tasks will also be regularly reviewed via Tool Box Meetings.

7.10 Attendant/Hole Watch

The Supervisor in direct control of the works will determine the number of attendant personnel required for the task.

He shall also ensure that such personnel have been trained and are fully conversant with all requirements contained in Section 4 of this procedure.

7.11 Fire Protection

Adequate fire protection suitable to the hazards involved shall be provided at all work locations. Number and type of fire extinguishers or equipment shall be determined by the HSE department.

Prior to the commencement of any hot works all combustible material shall be removed from the area or areas where hot work is to be undertaken.

7.12 Lighting/Electrical Equipment

- The use of electrical equipment inside confined spaces must be strongly discouraged; however, where this is not possible, a low voltage lighting and electrical toll shall be used.
- Only air must be used to drive pneumatic tools in confined spaces (except when the atmosphere is inert).
- Explosion (intrinsically safe) proof lighting, torches, tools and equipment must be used for potentially flammable areas
- All cables should be run through alternate opening(s) or be tied up & padded or insulated through the entry point to prevent contact and damage to cables
- All portable hand held tools pneumatically operated shall be fitted with a dead man Control switch.

7.13 Suspension of Work

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The CONTRACTOR HSE supervisor will exercise the right to cease any confined space activity should all requirements within these procedures not be complied with. The supervisor directly in control of the work and or the attendant/hole watch shall exercise the right to cease such activities should any adverse situation, whether inside or outside the confined space, arise which may affect the health and safety of personnel within the confined space. Should either situation mentioned above arise, employees will be instructed to evacuate the confined space until the problem is resolved to the satisfaction of the CONTRACTOR HSE Supervisor.

7.14 Means of Access to/Egress from a Confined Space

Adequate access to and egress from all confined spaces will be provided using either ladders, scaffolding or purpose made access platforms. The confined space working area will be organized in such a manner so as to provide as much unhindered work space as practicable. While personnel are actually inside the confined space the attendant/hole watch will maintain constant contact with the employees by either visual observation or verbal communication.

7.15 Selection of Personnel

All personnel selected to enter any confined space environment will have attended the Contractor confined space entry training program. All personnel selected to act as an attendant will have attended the Contractor Hole Watch training program. In both cases all individuals will be fully conversant with the operation of all emergency rescue equipment and equipment required to carry out the task safely.

7.16 Unauthorized Entry to a Confined Space

Whenever a confined space is left unattended and unoccupied the confined space shall be adequately posted with signs to prevent unauthorized entry.

8. CONFINED SPACE ACTIVITIES

8.1 Erection of Equipment (Installation of Vessel Trays)

Equipment such as vessel trays (internals) will be erected using a mobile crane or the vessel divide as the case may be. Trays will not be lifted or permitted to come into contact with any fabric or natural fiber rope slings.

- All vessel trays will be lifted using approved lifting gears
- Trays will be installed from the lower levels of the vessel to the top
- Trays will be delivered to the applicable access platform and manhandled (using suitable gloves) into position within the vessel.

For all vessels that have only a demister tray component at the top of the vessel, scaffolding will be erected in the bottom of the vessel to take up the entire void and provide a suitable platform to facilitate the installation of the trays.

Scaffolding will be inspected and tagged prior to use.

Personnel will not stand directly below any tray being lowered into a vessel.

8.2 Hot Work (Welding, Cutting and Grinding)

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During any welding or cutting activities there will be sufficient artificial air movement such as blowers are installed at the required positions to ensure fumes are forced out of the confined space and breathable air is continuously replenished. The suction of supply blower should be kept away from source of exhaust and fumes. In summer, cooling systems will be used to bring down the temperature inside the confined space.

During any cutting or welding, gas cylinders providing gases for welding or cutting will be secured in an upright position outside of the vessel and away from the entry point. At all times upon the completion of welding and cutting, the hoses and hand piece of the gas cutting/welding equipment will be removed from the confined space to prevent the inadvertent escape of gases into the confined space.

Any welding or cutting activities taking place in close proximity of the entrance to the confined space where there may be a possibility of contaminating the confined space will be suspended until work within the confined space is completed.

8.3 Use of Solvents, Chemicals and Argon Gas

Prior to the use of any solvents or chemicals inside any vessel all requirements stated on the material safety data will be met. These requirements will be entered on the permit and fully explained by the Job Supervisor to the permit receiver.

Additional requirements deemed necessary due to the confined nature of the working environment, combined with the potential for high concentrations of hazardous substance, will be determined by the PTW Coordinator in conjunction with the CONTRACTOR HSE Manager.

Additional requirements deemed necessary due to the confined nature of the working environment, combined with the potential for high concentrations of hazardous substance, will be determined by the PTW Coordinator in conjunction with the CONTRACTOR HSE Manager.

Typical requirements may include but not be limited to respiratory protection, intrinsically safe tools etc., details of which shall be entered on or attached to the work permit.

The provision of such requirements will be inspected and approved by the CONTRACTOR HSE Department prior to use.

9. ATTACHMENTS:

Attachment 1: Job Supervisor's Check List

Attachment 2: Job Supervisor/Entrant Check List Breathing Apparatus

Attachment 3: Attendant/Entrant Check List

Attachment 4: Minimum Requirements for Confined Space Entry Permit

Attachment 5: Confined Space Personnel Entry Log

Attachment 6: Periodic Atmospheric Gas Test Results

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ATTACHMENT 1: JOB SUPERVISOR'S CHECK LIST

(To be completed/checked by the Supervisor before starting work)

Check List Question	Yes	No
Entrants/supervisor has the training for this task?		
Is there the necessary work-permit?		
Are you familiar with the DEC procedures for entering confined spaces?		
Do you fully understand your specific responsibilities in respect of this task?		
Are you and the workforce wearing the appropriate personal protective clothing?		
Have you arranged for the appropriate fire protection and safety equipment?		
Are all connections to the confined space isolated/removed?		
Are all electrical/hydraulic connections in and outside the confined space locked-out and tagged?		
Are there radiation hazards?		
Is the confined space hazardous gas free?		
Is the oxygen level satisfactorily?		
Are there physical hazards in the confined space?		
Is (are) the necessary attendants) for stand-by responsibility assigned?		
Is the workforce (those who enter the space and attendants) familiar with the necessary safety procedures?		
Is the workforce physically and mentally fit?		
Have you ensured that all-breathing apparatus is functioning properly? (See Attachment 2)		
Have lifelines) or harness been provided?		
Does the electrical equipment meet requirements?		
Is the attendant/standby person(s) aware of his/her duties regarding communication with and rescue from the confined space?		
Is access and egress adequate for persons entering or leaving the confined space?		

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Will continuous monitoring take place during work to ensure confined space is gas free and has sufficient oxygen?		
Is there a contingency plan available and are all relevant personnel familiar with it?		
Have precautions been taken to make unauthorized access impossible especially when work is temporarily suspended?		
Do you know whom to refer to in the case of uncertainty?		
Is there an approved Rescue Plan in place and understood by all involved in the entry		

Job Supervisor Name: _____

Date: _____

Time: _____

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ATTACHMENT 2: JOB SUPERVISOR/ENTRANT CHECK LIST – BREATHING APPARATUS

(Where breathing apparatus is to be used, this section must be jointly check by the supervisor and the persons who will enter the space)

		Yes	No
Are you familiar with the apparatus to be used?			
Have you checked the communication equipment?			
Have you checked the apparatus as follows:			
	Adequacy of air supply? (At least 90% of maximum pressure)		
	Low pressure audible alarm?		
	Face mask - air supply and tightness?		
	Availability of emergency air supply when working in inert atmospheres?		
	Operating time limits calculated and checked?		
Have the emergency signals and other emergency arrangements been agreed?			

Persons entering the confined space should show their completed checklist to the Attendant before entering. The Attendant will also review the checklist with the Entrant before the Entrant enters the confined space

Entrant's Name: _____

Job Supervisors Name: _____

Attendant Name: _____

Date: _____

Time: _____

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ATTACHMENT 3: ATTENDANT/ENTRANT CHECK LIST

To be checked jointly by the attendant (s) and persons to enter the space after relevant checks have been made

Check List Questions	Yes	No
Have you been trained in enclosed space entry procedures and the responsibilities of an attendant?		
Have you been given instructions or permission by the supervisor, or person in charge, to enter the space?		
Are you satisfied all relevant checks have been completed?		
Do you understand the arrangements made for communication?		
Are you aware that you should leave the space immediately in the event of ventilation or communication failure?		

Entrant's Name: _____

Attendant's Name: _____

Date: _____

Time: _____

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ATTACHMENT 4: “MINIMUM REQUIREMENTS FOR CONFINED SPACE ENTRY PERMIT”

(To be completed by the Job Supervisor)

SECTION A: GENERAL INFORMATION (PLEASE PRINT)

1. Description of the Confined Spaces

2. Description of Work to be Performed: _____

3. Date Issued: ____/____/____
4. Time Issued: ____/____/____
5. Date Expires: ____/____/____
6. Time Expires: ____/____/____
7. Attendant: _____
8. Job Supervisor: _____
9. Client Signature: _____

(Note: The Attendant must attach and use a copy of Attachment 9 to maintain an accurate record of persons in the confined space at all times)

SECTION B: CHECK LIST FOR ISOLATION AND UNAUTHORIZED ACCESS PREVENTION

(Circle the correct answer and initial for each question)

- | | | | |
|---|-----|----|-----|
| 1. Are external barriers in place: | YES | NO | N/A |
| 2. Has mechanical lockout/tagout been Completed? | YES | NO | N/A |
| 3. Has electrical lockout/tagout been Completed? | | | |
| 4. Have other De-energizing steps Been completed:
If so, describe: _____ | YES | NO | N/A |
| 5. Have lines/pipes been disconnected? | YES | NO | N/A |
| 6. Have lines/pipes been blocked? | YES | NO | N/A |
| 7. Have lines/pipes been capped? | YES | NO | N/A |
| 8. Have barricades been set up? | YES | NO | N/A |
| 9. Have warning signs been placed? | YES | NO | N/A |

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(To be completed by the Job Supervisor)

Report Unauthorized Entry to: _____

Phone: _____

(Specify): _____

SECTION C: PRE-ENTRY CHECK LIST (Check or fill in the correct answers)

1. PURGING: Were lines/pipes purged? YES NO N/A
 If so, what method was used? Nitrogen Steam Water
 Other

(Specify): _____

2. VENTILATION:

Is forced ventilation being maintained: YES NO N/A

3. ATMOSPHERIC GAS TEST

a) Test Frequency _____

b) Performed by: _____

CAUTION: Toxic or flammable gases or vapors may stratify in the confined space. Be sure to test at various levels and locations within the confined space. Always check the oxygen content first.

TESTER INFORMATION	ATMOSPHERIC HAZARD TESTED	ACCEPTABLE RANGE OF HAZARD	ACTUAL READING (Record)	ACCEPTABLE? (Check one) YES/NO
Date:	Oxygen Content (O ₂)	19.5% - 23.5%	%	
Time	Combustible Gas (% LEL)	0%-10%	%	
Signature:	Other ((specify)	PEL = ppm	PPM	

NOTE: For additional/periodic atmospheric checks, use a copy of Attachment 7 and attach it to Permit.

4. **SPECIFIC HAZARDOUS TASKS:** Certain tasks performed in confined spaces greatly increase the risks to Entrants. Check all to be performed.

- Welding/Brazing Painting or Solvent-Cleaning
 Thermal Cutting Cleaning/Sweeping/Vacuuming
 Soldering Scraping/Removing Residue
 Other (explain)

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5. RESCUE PROCEDURE:

IN-PLANT RESCUE PERSONNEL:

OUTSIDE SOURCES & PHONE:

Name:	Phone/Radio	Fire Dept.	_____
_____	_____	Ambulance	_____
_____	_____	Hospital	_____
_____	_____	Other	_____

6. SPECIAL EQUIPMENT NEEDED (Check)

- Air-Purifying Respirators
- Air-Supplying Respirators
- Air-Supplying Respirators with Escape Bottle
- SCBA (for rescue personnel)
- Safety Harnesses
- Lifelines
- Hoisting Apparatus
- Communications Equipment _____
- Temporary Lighting
- Non-Sparking Tools
- Protective Clothing

Permit and Checklists prepared by: _____

Approved by (Unit Supervisor): _____

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ATTACHMENT 5: CONFINED SPACE PERSONNEL ENTRY LOG

Description of the Confined Space _____

Job Supervisor _____ Date: ____/____/____

Attendant (s) _____

Entrant's Name	Time In	Time Out	Time in	Time Out	Time in	Time Out

Note: Attached to the Confined Space Entry Permit for a Minimum of one year.

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ATTACHMENT 6: PERIODIC ATMOSPHERIC GAS TEST RESULTS

Description of the Confined Space: _____

Test Information	Atmospheric Hazard Tested	Acceptable Range of Hazard	Actual Reading (Record)	Acceptable (Check One)	
				Yes	No
Date:	Oxygen Content	19.5% - 23.5%	%		
Time:	Combustible Gas (% LEL)	0% - 10%	%		
Signature:	Other (Specify)	PEL = ppm	ppm		
Date:	Oxygen Content (% O ₂)	19.5% - 23.5%	%		
Time:	Combustible Gas (% LEL)	0% - 10%	%		
Signature:	Other (Specify)	PEL = ppm	ppm		
Date:	Oxygen Content (% O ₂)	19.5% - 23.5%	%		
Time:	Combustible Gas (% LEL)	0% - 10%	%		
Signature:	Other (Specify)	PEL = ppm	ppm		

Note: Attached to the Confined space Entry Permit for a Minimum of One Year.

Record monitoring results to be monitored at least every two hours.