CONFINED SPACE PROCEDURE				Document ID : SA-AMI-000-HDAI-710024	
				Contarctor Reference : 6601000283	
				Revision: 03	Step: IFU
				Rev. Date:12-Feb-2025	
Doc. Type: PRC	Discipline: CSE	Phase: DE	Class: 2	Page 1 of 38	
Vender Reference : N/A			System / Subsystem: NN	Equipment Type: N/A	

AMIRAL PROJECT

CONFINED SPACE PROCEDURE

Rev.	Step	Date	Revision Description	Issued by	Reviewed by	Approved by	Concurred by: Pkg. APMT
3	IFU	13-Feb-2025	Issue For Use	D.H.CHANG	D.S.LEE	Y.H.JUNG	
2	IFU	01-Dec-2024	Issue For Use	D.H.CHANG	D.S.LEE	Y.H.JUNG	
1	IFU	14-Nov-2024	Issue For Use	D.H.CHANG	D.S.LEE	Y.H.JUNG	
0	IFR	17-Jul-2024	Issu For Review	D.H.CHANG	D.S.LEE	Y.H.JUNG	

TABLE OF CONTENTS

1 PURPOSE

The purpose of this procedure is to provide clear guidelines for the safe entry, work, and exit in confined spaces at the AMIRAL PKG04 Project. This procedure ensures that all personnel, including employees, subcontractors, and visitors, are aware of the safety requirements and procedures to eliminate or control hazards associated with confined space entry. The goal is to protect the health, safety, and well-being of all individuals involved in confined space activities.

2 SCOPE

This procedure applies to all personnel, including employees, subcontractors, and visitors, who are involved in confined space operations at the AMIRAL PKG04 Project. It covers activities such as preparation, entry, work, and exit from any confined space. The procedure includes roles and responsibilities, safety measures, hazard controls, and emergency procedures to be followed by all individuals involved

3 CONFINED SPACE WORK ENTRY PROCEDURE

3.1. Identifying Confined Spaces

Recognition is an important aspect of making a safe entry into a confined space.

A Confined Space is any space that has the following characteristics:

1. It is a place which is substantially enclosed (though not always entirely), and where serious injury can occur from hazardous substances or conditions within the space or nearby (e.g. lack of oxygen).
2. It has limited or restricted means for entry or exit.

   Confined-space openings are limited primarily by size and location. Openings may be small in size and may be difficult to move through easily. However, in some cases openings may be very large; for example, open-topped spaces such as pits or excavations. Entrance and exit may be required from top, bottom, or side. In some cases, having to access the work area by a fixed ladder may constitute limited or restricted entry or exit. Size or location may make rescue efforts difficult.

3. It is not designed for continuous employee occupancy.

   Most confined spaces are not designed for employees to enter and work on a routine basis. They may be designed to store a product, enclose materials and processes, or transport products or substances. Because they are not designed for continuous occupancy, frequently they will not have good ventilation or lighting. Therefore, occasional employee entry for inspection, maintenance, repair, cleanup, or similar tasks can be difficult and dangerous. The danger associated with entry may come from chemical or physical hazards within the space.

3.2. Confined Space Entry

3.2.1. Identifying All Confined Spaces

- All confined spaces located within a facility or under the facility's control should be identified. Once the space has been identified as Confined, Contractor shall determine if a permit is required.
- All employees shall be made aware of these confined spaces through training or instruction provided by confined space entry supervisors. Assistance in this training shall be provided by Contractor Safety Department.
- Locations of Confined space entry activities below (but not limited to)
  - Vessels and Tanks.
  - Sewers
  - In the Pipelines
  - In the Pits
  - In the Ducts
  - Excavations
  - Under floor, including roof and ceiling voids (attics and basements)
  - Columns.
  - Manholes

3.2.2. List of Confined space Activities

- Here are some examples of confined space activities, but not limited to
  - Excavation and Initial Inspection
  - Soil Testing and Utility Installation
  - Shoring, Bracing, and Trench Box Setup
  - Welding, Cutting, Leak Testing and pressure Testing
  - Dewatering and Drainage Installation
  - Foundation Prep, Concrete Pouring, and Rebar Setting
  - Underground Tank/Vault Installation
  - Corrosion Protection and Scaffolding Setup
  - Electrical Grounding and Cable Work
  - Hazardous Material Handling and Cleanup
  - Backfilling, Compacting, and Temporary Support
  - Drilling, Boring, and Surveying
  - Manhole Installation and Pipeline Connections
  - Confined Space Rescue and Rescue Drill

3.2.3. Preventing Unauthorized Entry

- All employees shall be instructed by confined space entry supervisors that entry into a confined space is prohibited without an authorized permit.
- Confined space entry supervisor shall instruct all employees to list their names on the authorized permit before they will be allowed to enter a confined space.

3.2.4. Work Permit System

- When a confined space must be entered, a permit shall be completed in accordance to G.I. 2.100 and authorized by department heads, supervisors, or their designated representatives prior to entry of the confined space. This permit shall serve as certification that the space is safe for entry. The permit shall contain the date, the location of the space, and the signature of the person providing the certification.
- A permit shall not be authorized until all conditions of the permit have been met.

3.2.5. Planning the Entry

The first step towards conducting a safe confined space entry is to plan the entry. This will allow for the identification of all hazards, and for the determination of all equipment necessary, to complete the activity.

a. Gathering General Data

- Identify the confined space. Give the name or location of the confined space.
- Give the reason for entering the confined space. Be specific. Also, identify if hot work will be done.
- Identify the contents of the confined space. This refers to any chemicals or other materials and energy that are usually present in the confined space.

b. Identifying the Hazards

I. Toxic gases, oxygen deficiency, or explosive atmospheres.

- The Contractor will determine the oxygen content and record this on the entry permit.
- The Contractor will determine flammable gas content and record this on the entry permit.
- The Safety Officer will determine levels of H2S and Carbon Monoxide and record this on the entry permit.
- If a toxic substance is determined to be in the confined space during testing by the confined space entry supervisor, Environmental Health & Safety shall

be contacted to assist in obtaining a Material Safety Data Sheet or other chemical information to determine what type of personal protective equipment is required, the potential health effects, the Permissible Exposure Limits, and any other information needed to safely conduct the work.

- Contractor will determine mechanical and physical hazards. They should list all items and energy that will require lockout/tag-out, blanking and bleeding, disconnecting, or securing. Physical hazards should also be listed.

Note: Atmospheric gas testing shall be conducted prior to entering permit-required confined spaces. Contractor shall conduct these tests. Contractor's SA Authorized Gas Tester to conduct "Gas Test" on the confined space.

II. Risks of Temperature Extremes and High Humidity in Confined Spaces

- Review the Ventilation Plan: Ensure the plan is updated and specific to the space.
- Inspect Equipment: Check that ventilation equipment (fans, blowers, etc.) is working and correctly positioned.
- Verify Airflow: Measure airflow to confirm it meets required standards.
- Continuous Monitoring: Regularly check the ventilation system and air quality throughout the work.

c. Ventilation of the Confined Space

- Indicate whether mechanical or natural ventilation will be used. Describe the procedures to be used.
- Ensure proper ventilation inside the confined space by following the equipment ventilation plan (Refer Attachment 6)

NOTE: If mechanical ventilation is to be used, the exhaust must be pointed away from personnel or ignition sources. Also, mechanical ventilators should be bonded to the confined space. (Refer to Attachment 7)

d. Isolating the Confined Space

- Describe the procedures for disconnecting equipment or lockout and tag-out. All mechanical, electrical, or heat-producing equipment should be

disconnected or locked and tagged out. This would also include any pumps that pull fluid from, or pump fluid into the confined space.

e. Purging/Cleaning the Confined Space

- If the confined space will be purged. Purging with inert gas is not recommended.
- Determine the safest type of cleaning methods to be used. If chemical cleaners are to be used. Material Safety Data Sheet (MSDS) for the chemical should be consulted prior to use.

NOTE: When introducing a chemical into a confined space, the compatibility of that chemical with the contents of the confined space must be checked. If in doubt, consult Safety Department.

NOTE: If steam is to be used, the hose should be bonded to the confined space.

f. Placement of Warning Signs

- Indicate if warning signs or barriers will be needed to prevent unauthorized entry or to protect workers from external hazards. If the confined space will be left open and unattended for any length of time, warning signs and barriers such as barricades and/or caution tape will be required.

g. Identifying All Personnel

- List all employees that will be required to prepare the confined space and complete the work inside the space.

h. Identifying Necessary Equipment

- List all equipment that will be necessary to complete the project.

3.2.6. Conducting Pre-Entry Training

Once the entry has been planned, department heads or their designated representatives must ensure employees who will be involved in the entry are adequately trained. The training should be conducted no earlier than one day before entry is to be made.

The following outline should be used for the training:

a. Identify the confined space and the reason(s) for entry.

b. Identify work detail

- Assign each employee the job(s) he is to perform in the entry project (entrant, standby person, etc.).
- If an employee is required to use a piece of equipment, be sure that he is trained and capable of using the equipment properly.
- Inform all personnel that no one is to enter the confined space unless the attendant is present at the work site.

c. Inform entrants of all known or suspected hazards

- Inform personnel of any access or exit problems.
- Inform personnel of all equipment that must be locked out or tagged out.
- Inform personnel of the contents of the confined space.
- Inform personnel of all atmospheric levels that must be maintained before entering and while working in the confined space.

d. If a toxic atmosphere or substance is present or could become present, the following additional training must be completed:

- If respiratory protection is not going to be used, inform personnel of the maximum permissible exposure level (PEL) that can exist within the confined space, and the method used to monitor PEL.
- Inform personnel of the potential health effects of exposure to the toxic atmosphere or substance.
- Inform personnel of the signs and symptoms of exposure to the toxic fume.
- Inform personnel of the personal protective equipment (PPE) that they will be required to wear.
- If entrants are unaware of the proper use of the PPE, they must be trained in the proper use of this equipment.
- Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. A local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (annually).

d. Isolation procedures as per G.I. 6.012
   - Inform the personnel responsible for the lockout/tag-out of all equipment that must be isolated.
   - Inform the personnel responsible for performing this function of the methods to be used.

e. Identify purging and/or ventilation procedures
   - Inform all personnel responsible for performing this function of the methods to be used.

f. Identify all equipment needed
   - Inform personnel involved in the project of all equipment that will be necessary to complete the project.
   - Make sure that all employees are capable of using their assigned equipment properly.

g. Determine necessary personal protective equipment
   - Inform personnel of all PPE that must be used to ensure their Safety.
   - Make sure that all personnel required to use PPE are trained in the proper use of the equipment.

h. Establish communication
   - Inform all entrants that they are required to maintain communication with the attendant
   - Inform attendant that he must maintain constant contact with all entrants.
   - Inform personnel of the type of communication they are to use.

i. Protect from external hazards
   - Inform personnel where signs and barriers will be placed to prevent unauthorized entry and protect entrants from external hazards

j. Pre-plan rescue procedures
   - The designated attendant(s) should be informed of the rescue procedures to be followed. Rescue procedures to be used are listed in this section.
   - The attendant should be informed that he can have no other duty but to

maintain contact with personnel inside the confined space.

- Inform the attendant(s) that they must not enter the confined space under any circumstances.

k. Place the confined space back into service

- Inform personnel of the steps to be taken to place the confined space back into service.

3.2.7. Preparing the Confined Space for Entry

Once the entry has been planned and personnel have been trained, the next step is to prepare the confined space for entry.

The following steps are to be followed when preparing the confined space for entry:

a. Contractor shall provide warning signs or barriers around the confined space to prevent unauthorized entry as necessary.

b. Place all tools, Safety Equipment, monitoring equipment, etc., near the confined space.

c. Contractor's SA Authorized Gas Tester shall conduct the "Gas Test" on a confined space prior to the issuance of a Confined Space Entry Permit.

d. Test the atmosphere using an appropriate gas monitor.

- If oxygen content is less than 20.0% or greater than 23.5%, perform additional ventilation. Then shut off ventilation equipment and re-test the oxygen content.
- If oxygen content is between 20.0% and 23.5%, continue entry preparation.

e. Test for flammable gases.

- If the meter reading is less than 10% of the lower explosive limit (LEL), continue entry preparations.
- If the meter reading is above 10% of the LEL, continue ventilation of the confined space. Then shut off the ventilation and have the atmosphere re-tested.
- If the meter reading is still above 10% of the LEL, the confined space must

be cleaned before entry is permitted. If the confined space must be entered for cleaning purposes, the procedures outlined in Section 3.2.9 of this procedure must be followed.

f. Test for toxics (If a toxic atmosphere is present, no person should be permitted to enter the confined space at a level exceeding the Permissible Exposure Limit without proper Personal Protective Equipment. Environmental Health & Safety should be called to assist in identifying proper precautions and the protective measures to be taken.

g. Isolate all mechanical and/or electrical hazards as necessary in accordance to G.I. 6.012.

h. Purge / ventilate the confined space as necessary.

i. Assemble all personnel involved and review rescue procedures. Contractor will then add any needed information.

j. Notify the COMPANY that entry is commencing.

3.2.8. Utilizing Safety Equipment

Where practical, all personnel entering a confined space should be equipped with a retrieval line secured at one end to the entrant by a full-body harness with its other end secured to a tripod lifting hoist.

3.2.9. Atmospheric Gas Testing Procedures

a. Only personnel having a valid gas testing certificate may perform the gas test in accordance with the requirement of G.I. 2.100.

b. Atmospheric gas testing is required at all locations where injury to personnel or damage to property could occur due to the presence of combustible gases, toxic gases, or oxygen enriched/deficient atmospheres. Atmospheric gas testing shall be performed, but not be limited to the following work activities/situations:

- Oxygen (O2) testing shall be conducted for:
  - ✓ All confined space entry activities.
  - ✓ All areas which may have a potential for an oxygen deficient or enriched atmosphere.

- Combustible gas testing (i.e., LEL) shall be conducted for:
  - ✓ All confined space entry activities.
  - ✓ All hot work in restricted areas, as defined in G.I. 2.100.
  - ✓ All work locations where combustible gases are or may be present.
- Hydrogen sulfide (H2S) gas testing shall be conducted for:
  - ✓ All confined space entry activities where H2S may be present.
  - ✓ Jobs in areas where sour crude/gas is produced, transported, stored or processed and where proponent organizations determine that H2S gas testing is necessary.
  - ✓ Jobs in close proximity to sewage treatment plants and sewer lift stations.
  - ✓ All work locations where H2S monitoring is required for work or operational purposes.
- Carbon monoxide (CO) gas testing shall be conducted for all confined space entry activities that involve combustion (e.g., welding, torch cutting).

c. Initial gas testing prior to entering a confined space shall be performed with all mechanical ventilation shut down at least 15 minutes prior to testing.

d. Whenever testing of the atmosphere results in a gas monitor alarm condition (see Supplement 2.709-2, Portable Gas Monitor Alarm Set Points), work shall be stopped until proper controls are implemented, appropriate work procedures established and suitable personal protective equipment is used.

Confined Space Entry	Oxygen (O_2)	Flammable/ combustible Mixtures	Carbon Monoxide (CO)	Hydrogen Sulfide (H_2S)
Permitted without an atmosphere-supplying respirator	At or above 20% and less than or equal to 23.5%	Less than 5% of LEL	Less than 35 ppm	Less than 10 ppm
Permitted only while continuously wearing an atmosphere-supplying respirator	Less than 20%	At or above 5% and less than 10% of LEL	At or above 35 ppm and less than 1,000 ppm	At or above 10 ppm and less than 100 ppm
No entry permitted	Above 23.5%	At or above 10% of LEL	At or above 1,000 ppm	At or above 100 ppm

3.2.10. Confined Space Cleaning Procedures in accordance with G.I. 6.012

If cleaning must be conducted in a confined space to achieve acceptable atmospheric conditions, the following procedures must be followed:

a. All entrants must be equipped with the Safety Equipment designated in Section 3.2.7.

b. All entrants must be equipped with Self Contained Breathing Apparatus (SCBA)

c. No spark-producing tools will be allowed for use.

3.2.11. Purging and Flushing

If a confined space contains an atmosphere that is flammable or considered immediately dangerous to life or health (IDLH), the area will require purging before employees can enter. Continual forced ventilation is necessary to keep some areas safe during entry

3.2.12. Barriers and CSE Perimeter Controls

Barriers must be placed around Permit Required Spaces when conditions may cause injury. Conditions may include:

- Unauthorized entry.
- Objects falling into the space.
- Vehicular hazards around the space.

Precautions shall be taken to ensure that air contaminants from vehicle exhausts, adjacent processing, or chemical handling cannot enter the confined space.

3.2.13. Access and Egress Requirement

A safe means of access and egress from all confined space areas shall be provided. Scaffolding, ladders, stairways and walkways shall be kept clear of materiaI and debris.

3.2.14. Fall Protection Requirement

Fall protection (e.g., full-body harness/lanyard, scaffolding) shall be used if personnel could fall more than 1.8 m (6 ft.) when working inside the confined space. Refer to Chapters II-2, Scaffolding, and II-5, Fall Protection of the CSM.

3.2.15. Personal Protective Equipment Requirement

The proper personal protective equipment (PPE) shall be provided to personnel entering a confined space and to each standby man. PPE shall be continuously used during the confined space entry. Refer to Chapter I-3, *Personal Protective Equipment (PPE)* of the CSM.

3.2.16. Rescue Procedures

In the event of an emergency, the attendant shall follow the Emergency Rescue Procedure. A rescue team are readily available in the event of an emergency requiring evacuation of the confined space (Refer to Attachment 6)

3.2.17. Contractor Isolation Procedure

Isolation, lock out and tag out system in accordance with the "**Amiral"** System shall be established.

Maintenance personnel shall ensure that the controls of the equipment they are working shall be properly locked and tagged in the off position before leaving.

To prevent any accident caused by mistakes, such as starting equipment on which maintenance men are currently working on or vibrations and ineffective mechanisms that can cause controls to move or valves to open, controls shall be locked in the off position.

Supervisors of operations and maintenance shall be familiarized with the rules in Saudi Aramco G.I. 6.012, Isolation, lock out and use of Hold Tags and shall teach their crew the lockout procedure and ensure that they are followed accordingly.

3.3. Confined Space Entry Work Permit

Confined Space Entry Work Permit (Green)

Confined Space Entry Work Permit is required for any activity such as; tank cleaning, tank inspection, work in sewage or excavation of 4 feet or deeper.

All work in restricted areas must have a WORK PERMIT. Work must be performed according to the instructions and precautions specified in the work permit.

Confined Space Entry Plan

Prior for application of confined space entry permit a Confined Space Entry Plan is required, to identify the potential hazards and preventive measures, to determine the necessary equipment to be use, the method of ventilation, etc. (Refer to attachment 2 – Confined Space Entry Permit Plan).

Each confined space is unique, and each unique confined space requires a detailed plan for that specific confined space, each confined space plan shall have a specific rescue plan for that unique confined space. There will be vertical confined spaces, horizontal confined spaces, excavations that are confined spaces, area underneath

a portable building that are a confined space and many more types of confined spaces. Therefore, no one plan is acceptable and each plan needs to be developed on a case-by-case basis.

Issuance & Approval

The authorized permit receiver must request a work permit from the work permit controller before doing any type of work in the restricted area.

If the work area falls under the responsibility and control of the Company, a Company Work Permit shall be applied.

The issuer will grant the work permit after he has visited the site with the receiver, reviewed the hazards applicable to the particular job, and is satisfied that the work can be done safely. If the work contemplated involves any change, addition, or deletion in the facility, the work should be reviewed by an Engineer and appropriate authorization is necessary.

Precautions

1. Checklist

Each permit contains a checklist of precautions against common hazards. Such a list cannot include precautions against all hazards. It is the duty of both the Issuer and the Receiver to review the job, anticipate what hazards might have been specified on the permit before it is signed.

2. Clear Area

Once specified precautions applying to all work is to clear the area of people not required for the job to avoid their being exposed to unnecessary hazards. If people entry an area where they could be exposed to undue danger, the work should be stopped until they are cleared from the area.

3. Work Stoppage

If conditions change or become unsafe during the course of work the issuer or confined space entry supervisor may stop the work and cancel the permit.

The receiver has the responsibility to stop the work and advise the issuer or supervisor anytime he feels the Health Safety and Environment of the job does not meet the conditions of the work permit.

Handling of Issued WORK PERMIT

A work permit is valid for only one shift, but it may be extended for one addition shift with proper approval. Exceptions in excess of 16 hours may be granted in special cases, provided certain precautions are taken (See G.I. 2.100 for details)

The receiver of the work permit must keep the permit posted at the job location at all times.

The receiver of a work permit must keep a copy in his possession or within view of the job site for the duration of the job and shall be readily available upon request.

Closing Out & Filling the Permit

When the job is completed or at the end of the shift, each work permit must be closed out by both issuer and receiver. The only exception shall be distance and remoteness make signing impractical, and it is so stated when the work permit is issued. The work permit will be filed and kept by the issuing department for three months.

Hold Tags & Multiple Lockouts

Hold Tags and Locks are primarily intended to protect the individual doing the work from being injured by an inadvertent start up.

Work permit issuers shall ensure that hold tags and lock outs are used so noted on the work permits. The use of hold tags/lock outs shall be strictly enforced.

4 CONFINED SPACE RESCUE PROCEDURE

4.1. Purpose

The purpose of this procedure is to ensure that an effective rescue can be initiated and performed within a reasonable amount of time for personnel working inside any identified confined space.

This procedure does not replace the Emergency Response Plan that has been developed by the Contractor. Additionally, a Confined Space Rescue Plan must be in place before the start of any confined space activities to ensure the safety and well-being of all personnel involved.

4.2. Responsibilities

4.2.1. Site Management:

- Ensure that necessary resources are provided to the Emergency Response Team (ERT) to execute a rescue effectively.
- Ensure that the Emergency Response Team receives adequate training to perform rescues and respond to emergencies..
- Oversee site operations to ensure compliance with safety protocols during emergency situations.
- Provide support and coordination for all emergency response actions on-site.

4.2.2. Safety Manager – Incident Commander

- Act as the Incident Commander during an emergency, leading and coordinating all emergency response actions.
- Ensure the Emergency Response Team (ERT) is activated immediately when required, and ensure sufficient resources are available for the response.
- Activate the Medical Team and ensure they are dispatched to the incident area for immediate medical support and triage.
- Inform the Project Manager of the incident promptly and provide updates on the situation as it develops.
- Ensure that the Emergency Response Team is properly trained and

equipped to handle emergencies effectively.

- Conduct debriefings after incidents to review the effectiveness of the response and identify areas for improvement.
- Maintain oversight of the emergency response and ensure that it complies with company policies and industry regulations.

4.2.3. Work Permit Receiver (WPR)

- Communicate directly with the Emergency Response Team (ERT) and Incident Commander in the event of an emergency to facilitate swift rescue operations.

4.2.4. Authorized Gas Tester (AGT)

- Continue to monitor atmospheric conditions during confined space work and during the rescue process to ensure a safe environment for rescue personnel.
- Provide real-time updates to the WPR, Emergency Response Team, and Site Management on any changes in air quality or the presence of hazardous gases.
- Ensure that all gas monitoring equipment is calibrated and functioning properly before, during, and after confined space operations.
- Assist in determining whether the confined space is safe for entry during the rescue and ensure continuous air monitoring during the extraction process.

4.2.5. Subcontractor Site Manager:

- Ensure that all subcontracted personnel are familiar with site emergency procedures and trained in emergency response.
- Coordinate with the Main Site Management team to ensure subcontracted workers' roles and responsibilities during an emergency are clear.
- Assist the Emergency Response Team in managing emergencies involving subcontracted personnel

4.2.6. Subcontractor HSE Manager

- Ensure that all subcontractor personnel are informed of the hazards

associated with confined space entry and that they receive training in emergency response protocols.

- Coordinate with the Site Management and Emergency Response Team to ensure that appropriate resources (personnel and equipment) are available for rescue operations.
- Conduct regular safety audits to ensure compliance with confined space entry and rescue procedures.
- Ensure that hazardous gases or materials are monitored and managed appropriately before, during, and after confined space operations.

4.2.7. The Medical Team

- Respond to the affected area immediately with the ambulance.
- Ensure that the injured person are treated.
- Liaise with Emergency Response Team for extrication of injured worker.
- Render assistance where possible.
- Ensure that the injured are transported to the clinic or a hospital.
- Fill in all forms and records relevant to the incident.

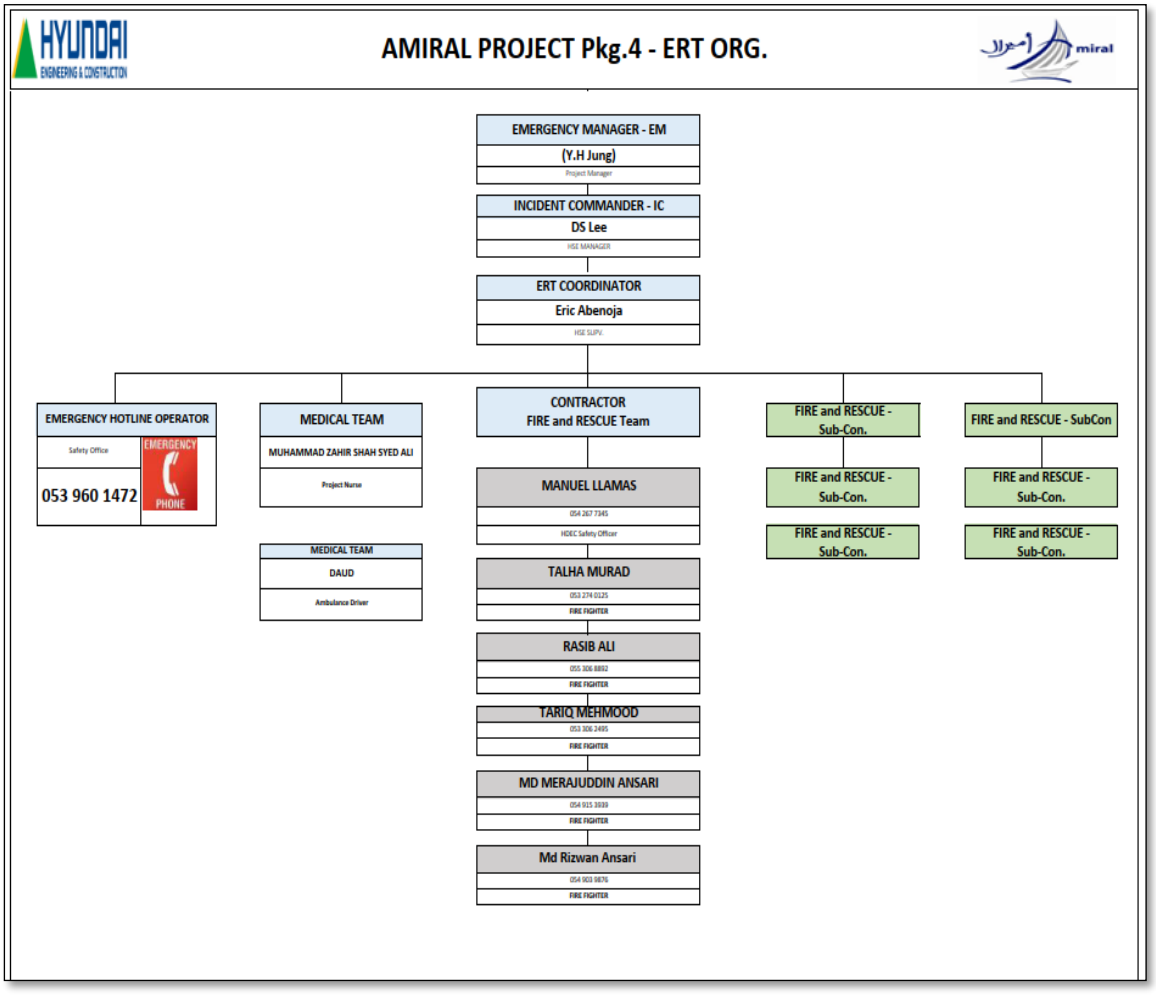
4.2.8. First Responder

- Call the Emergency Contact Number and provide full details regarding the location, type and extent of incident, number of persons injured etc.
- Warn other employees in the area about hazards associated with the incident which may place them at risk.
- Cooperate with the emergency teams.
- Ensure that guides are placed at strategic locations to guide the Emergency Crew to the exact location of the incident.
- Stabilize the condition of the injured worker, if any and if possible.
- Secure the area.

4.2.9. Emergency Response Team

- To receive instruction from the incident Commander as required.
- Follow their training procedure.
- Personnel who are going to conduct rescue activities need to have specialized training.
- Rescue person from the Confined Space.
- Coordinate with the Field Safety Officers to secure area and passage

4.2.10. Site Emergency Response Team



4.3. Procedure

- Identify the on-scene supervisor and obtain relevant scene information which is safe to proceed.
- The Rescue Team shall be provided with the correct and appropriate PPE and other safety equipment needed for the specific rescue task.

- Safety harness
- Positive Pressure Breathing Apparatus (BA)
- Life Line
- Lighting System

- Assess confined space risks, identify and implement corrective action to mitigate the risks in order to ensure a safe rescue.

- Continuous gas monitoring and ventilation
- Means of escape

Identify and establish the confined space rescue plan before starting work for each activity below but not limited to; (Refer attachment # 3)

- Internal cleaning
- Installation activities
- Hot work activities
- Inspection
- Excavation
- Manhole activities

- Proceed to enter confined space to locate person to be rescued and implement rescue plan as decided.

- Ensure “Hole-watch” is present
- Rescuer enter confined space
- Assess the IP for Vital signs

- Administer CPR and apply life support system to stabilize IP when necessary
- Doctor/Nurse to engage in the assessment and application of advanced life support of the IP
- When IP is stabilized, proceed with packaging and retrieval from confined space.

- When confined space is at height, follow the Elevated Rescue Procedure.
- When the IP is in a confined space which is below ground level

- A rescuer will assist and guide the IP to be transferred through ambulance for transporting to the medical facility as required.

5 ATTACHMENT

Attachment 1 – Confined Space Entry Permit Form

Attachment 2 – Confined Space Entry Plan

Attachment 3 – Confined Space Rescue Plan

Attachment 4 – Confined Space Entry Checklist

Attachment 5 – Confined Space Entry / Exit Log

Attachment 6 – Equipment ventilation plan

Attachment 7 – Confined Space Entry Equipment

Attachment 8 – Confined Space Rescue and First Aid Flow Chart

Attachment 9 – Confined Space Rescue Equipment

Attachment 1 – Confined Space Entry Permit

HYUNDAI ENGINEERING & CONSTRUCTION

CONFINED SPACE ENTRY PERMIT

PERMIT NO. 000001

Joint Job Site Inspection When Issuing and or Closing Out Work Permit is Required

Work Description

CONTRACTOR		PTW Receiver	
Telephone number		Badge number	
Location of work		Plot plan attached Yes ☐ No ☐	Rescue Plan Approved/Attached Yes ☐ No ☐
Work description		Permit Reference No.	

Special Protection

☐ Hard Hat ☐ Gloves ☐ Safety Shoes ☐ Goggles ☐ Face Shield ☐ FRC	☐ Full Body Harness/Double Lanyard ☐ Respirator ☐ SCBA (used for job) ☐ SCBA (stand-by) ☐ Hearing Protection ☐ Barricades	☐ Breathing air line ☐ GFCI/ELCB ☐ Grounding ☐ Air movers (exhaust/blowers) ☐ Flagman (trained) ☐ Rigger (certified)	☐ Warning Signs ☐ High-Vis Vest ☐ Access Ladder ☐ No Reversing ☐ Other

Isolation and Preparation

PEFS attached ☐	Lines Blinded / Broke ☐	Lock Out / Tag Out ☐	Purged / Cleaned ☐
Inert Complete ☐	Ventilation / Blower ☐	Safe Access ☐	Lights (low voltage with GFCI / handheld) ☐
Scaffold Approved ☐	Barricades/Warning Signs ☐	Other:	

Emergency

Trained Stand-By Man ☐	Emergency Contact Numbers Posted Nearby ☐	Rescue Plan Attached ☐	Mechanical Hoist Rescue Equipment ☐
Two-Way Radio ☐	SCBA ☐	Rescue at Height Equipment ☐	Battery Torch Lights ☐

Standby Man

Name	Badge No.	Signature

Approvals

PTW RECEIVER		Signature:		Date:	
HDEC Construction Section Manager / Supervisor		Signature:		Date:	
PTW ISSUER		Signature:		Date:	
Permit Start Date:			Permit Finish Date:		

Confined Space Permit Activity Examples (Include But Not Limited to)

Tanks	Excavations > 1.2M	Tunnels	Silos
Piping	Manholes	Crawl Spaces	Machinery Cabinets

A Breathing Apparatus shall be used if any of the following atmospheric condition exist:

O2 concentration is below 20.0%	Flammable/Combustible mixtures are at or above 5% LEL	H2S Concentration is at or above 10 ppm	CO concentration is as or above 35 ppm

※ Use and Attach Entry / Exit Log Sheet

See Back for Supplementary Information – Must be Completed Before Issuance of Permit

GAS TEST #1				
Classification	Name	Badge No.	Telephone No.	Date and time
Standby man				
Authorized Gas Tester				
Atmospheric Hazard Tested	Acceptable Range of Hazard	Actual Reading (Record)	Acceptable (Yes / No)	SCBA required (Yes / No)
Oxygen (%)	20.0 % – 23.5 %	%		
Combustible Gas (% LEL)	Hot work 0% / Others 10%	%		
H2S Gas (ppm)	0 – 100 ppm	ppm		
CO Gas (ppm)	0 – 1,000 ppm	ppm		
GAS TEST #2				
Classification	Name	Badge No.	Telephone No.	Date and time
Standby man				
Authorized Gas Tester				
Atmospheric Hazard Tested	Acceptable Range of Hazard	Actual Reading (Record)	Acceptable (Yes / No)	SCBA required (Yes / No)
Oxygen (%)	20.0 % – 23.5 %	%		
Combustible Gas (% LEL)	Hot work 0% / Others 10%	%		
H2S Gas (ppm)	0 – 100 ppm	ppm		
CO Gas (ppm)	0 – 1,000 ppm	ppm		
GAS TEST #3				
Classification	Name	Badge No.	Telephone No.	Date and time
Standby man				
Authorized Gas Tester				
Atmospheric Hazard Tested	Acceptable Range of Hazard	Actual Reading (Record)	Acceptable (Yes / No)	SCBA required (Yes / No)
Oxygen (%)	20.0 % – 23.5 %	%		
Combustible Gas (% LEL)	Hot work 0% / Others 10%	%		
H2S Gas (ppm)	0 – 100 ppm	ppm		
CO Gas (ppm)	0 – 1,000 ppm	ppm		
GAS TEST #4				
Classification	Name	Badge No.	Telephone No.	Date and time
Standby man				
Authorized Gas Tester				
Atmospheric Hazard Tested	Acceptable Range of Hazard	Actual Reading (Record)	Acceptable (Yes / No)	SCBA required (Yes / No)
Oxygen (%)	20.0 % – 23.5 %	%		
Combustible Gas (% LEL)	Hot work 0% / Others 10%	%		
H2S Gas (ppm)	0 – 100 ppm	ppm		
CO Gas (ppm)	0 – 1,000 ppm	ppm		
GAS TEST #5				
Classification	Name	Badge No.	Telephone No.	Date and time
Standby man				
Authorized Gas Tester				
Atmospheric Hazard Tested	Acceptable Range of Hazard	Actual Reading (Record)	Acceptable (Yes / No)	SCBA required (Yes / No)
Oxygen (%)	20.0 % – 23.5 %	%		
Combustible Gas (% LEL)	Hot work 0% / Others 10%	%		
H2S Gas (ppm)	0 – 100 ppm	ppm		
CO Gas (ppm)	0 – 1,000 ppm	ppm		
GAS TEST #1				
Classification	Name	Badge No.	Telephone No.	Date and time
Standby man				
Authorized Gas Tester				
Atmospheric Hazard Tested	Acceptable Range of Hazard	Actual Reading (Record)	Acceptable (Yes / No)	SCBA required (Yes / No)
Oxygen (%)	20.0 % – 23.5 %	%		
Combustible Gas (% LEL)	Hot work 0% / Others 10%	%		
H2S Gas (ppm)	0 – 100 ppm	ppm		
CO Gas (ppm)	0 – 1,000 ppm	ppm		

Note: For More and Complete Details please refer to **Permit To Work System (SA-AMI-000-HDAI-710007_Permit to work system).**

Attachment 2 – Confined Space Entry Plan

CONFINED SPACE ENTRY PLAN (CSE PLAN)

MARJAN INCREMENT PROGRAM PACKAGE 6 PROJECT								CSEP SHALL NOT EXCEED 7 DAYS			
LOCATION:								START DATE:		END DATE:	
VALIDATION	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	COMPANY			
CSE PERMIT #:											
PTW SIGNATURE:								NUMBER OF EMPLOYEES			
SCOPE OF WORK											
ISOLATION METHOD	□ Locked switch/breaker □ Blinding □ Disconnect							**Note: Attach drawing showing each isolation point as well as blind list.**			
ELIMINATING ATMOSPHERIC HAZARDS BY:	□ Purging □ Cleaning □ Flushing □ Steaming-out □ Natural Ventilation □ Mechanical Ventilation □ N2/CO2 inerting							ATMOSPHERIC GAS TESTING TYPES AND FREQUENCY		□ O_2 □ CO □ H_2S □ LEL □ Others: ..... □ Frequency: .....hrs.....	
TYPES OF EQUIPMENT REQUIRED:	□ Self-contained breathing apparatus □ Air movers □ Harness and Retrieval Line □ Fire extinguisher □ Communication equipment □ Lighting equipment □ Rescue equipment (**Select Below**) □ Paraguard Strecther □ Basket Strecther □ Tripod / Manual Winch □ Crane										
ACCESS AND EGRESS	□ Ladder required □ External scaffold required □ Internal scaffold required □ Fall Protection required □ Platform modification required □ Other:										
PROTECTION OF SURROUNDING AREAS	□ Edge Protection □ Caution tape □ Hard barricade □ Warning lights □ Warning signs □ Flagman							MEANS OF COMMUNICATION WITH ENTRANTS		□ Whistle □ Retrieval Line signals □ Radios □ Air Horn □ Other: ..... □ Signals were discussed with personnel before entry	
PREVENTION OF UNAUTHORIZED ENTRY	□ Posting a sign (Do Not Enter) □ Closing the entry point □ Watchman □ Sealing the entry point by warning tape □ Other										
EMERGENCY RESPONSE PROCEDURE	1. Call the Emergency Hotline Number **(058-034-8901)** 2. Secure the area or Clear the working area. 3. Rescue Methodology **(Select below appropriate Rescue Methodology applied to the activity)**										

RESCUE METHODOLOGY (Non-Entrty Rescue is always preferred)

□ 1. **Non-entry rescue –** involves attempting to extricate an incapacitated person without having anyone else enter the confined space. This can be done via a safety line attached to the personnel in the confined space or by grabbing the personnel with a rope, strap, winch or pole and pulling them to safety.

□ **2. Entry rescue** – this involves the use of a rescuer to enter the confined space and save an incapacitated individual. Emergency Rescue team is responsible for initial response to take the IP from Confined Space to Safe Ground,

□ **2.1- Manual Rescue :**

- Emergency Response Team (ERT) will bring the rescue stretcher at the confined space
- Emergency Response Team (ERT) will load the injured person to the rescue stretcher
- Secure the injured person in the rescue stretcher
- Lift manually the rescue stretcher with the injured person
- Bring up to the safe ground area to hand over to medical team.

□ **2.2. - Equipment Rescue:**

□ **2.2.A – Tripod / Manual Winch**

- Emergency Response Team (ERT) will bring the rescue stretcher at the Confined Space
- Emergency Response Team (ERT) will load the injured person to the rescue stretcher
- Secure the injured person in the rescue stretcher
- Rig up the IP and hand over to medical team.
- Emergency Team will set the winch or Tripod to the confined space location.
- Emergency Response Team (ERT) will bring down the hook of the winch at the Confined Space
- ERT team will attach the hook of the winch to the FBH carabineer of the IP
- Rig up the IP and hand over to medical team.

□ **2.2.B – Crane**

- Emergency Response Team (ERT) will bring the rescue stretcher at the Confined Space
- Emergency Response Team (ERT) will load the injured person to the rescue stretcher
- Secure the injured person in the rescue stretcher
- Attached the sling to the rescue stretcher lifting eye
- Provide tag lines to the stretcher to control the rigging rescue operation
- Rig up the rescue stretcher to the safe location and hand over to medical team.

Drawing	**The attach drawing of the confined space must show ALL Isolation points, Entry and Ventilation points.**

Confined Space Entry Plan Rev 6

	Name	Position	Badge #	Signature	Date	Additional documents required before initiating CSE activities:
Prepared by: CSE Supv.						
Reviewed and Approved by: Construction Supv.						□ CSE Work Permit □ Gas Testing Log Sheet □ CS Entry Log Sheet □ Job Safety Analysis
Checked by : HSE Personnel						

1. **CSEP WILL NOT EXCEED 7 DAYS. If additional time is needed, a new CSEP will have to be prepared and approved.**
2. **Copy of both sides of this Approved CSEP must be posted at the entrance of the Confined Space in clear plastic envelopes.**
3. **Initial confined space entry into pits, sumps, vessels, tanks, drums, or other process equipment that may have previously contained flammable, combustible, or toxic materials will require additional approvals by proponent management prior to work commencing.**

Attachment 3 – Confined Space Rescue Plan

HYUNDAI ENGINEERING & CONSTRUCTION

Confined Space Rescue Plan

ساتورب satorp

Reason for entry:

Work activity description: .....

Nature of work to be undertaken: .....

Confined space to be entered:

Description: .....

Location: .....

Potential hazards:

Entry Permit Supervisor Name:

Rescue Personnel:

Rescue team:

Name: ..... Employer: ..... Date: .....

Name: ..... Employer: ..... Date: .....

Name: ..... Employer: ..... Date: .....

Communication Controls:			
Minimum requirements will include:	Yes	No	Provide details as required:
One stand-by person			
Two/more stand-by personnel			
Rescue team			
Communication via voice/direct sight			
Communication via two way radio			
Communication via hand signals			
Communication via rope signal			
Mobile phone available to ring emergency services			
Rescue / Retrieval Considerations:			
Minimum provisions required:	Yes	No	Provide details – Specifically for Complex Scenarios:
Stand-by person to individually handle			
Safety harness/rescue kit in vicinity with competent user(s)			
Specific access platforms/scaffolding erected			
Specific fire fighting provisions			
First aid kit in vicinity			
Other:			
Personal Protective Equipment (PPE) Requirements & Other Precautions			
Minimum PPE / other items required:	Yes	No	Provide details as required:
Supplied air breathing apparatus			
Air purifying respirator			
Particulate mask			
Safety harness and lanyard/lifeline			
Head protection/Foot protection			
Face shield/goggles/safety glasses			
Ear muffs/plugs			
Gloves			
Warning notices / barricades required			
Specific lighting provisions required			
Specific hot work permit required			
Other:			
Attachments (other documents/plans prepared)			

Page 1 of 4
REV.00

HYUNDAI ENGINEERING & CONSTRUCTION

Confined Space Rescue Plan

ساتورب satorp

Methods of Rescue			
Requirements can include:	Yes	No	Provide details as required:
External (Retrieval)			
Internal:			
with SCBA			
without SCBA			
Anchorage:			
Tripod			
Beam			
Stairwell			
Support Strut/Column			
Overhead			

The atmosphere in the space is safe to enter:

☐ Without respiratory protection ☐ With an air purifying device ☐ With a supplied-air device

Rescue Equipment requirements			
Requirements can include:	Yes	No	Provide details as required:
Harnesses			
Tripod			
Rescue System			
Main Lines			
Safety Lines			
Carabiners			
Shock absorbers/Lanyards			
Gas Detector			
Other:			

Rescue Equipment inspected by:

Identified rescue equipment inspected by a competent person:

Name: ..... Employer: ..... Date: .....

Name: Employer: Date:

First Aid personnel:

First Aid personnel :

Name: ..... Employer: ..... Date: .....

Name: Employer: Date:

Principal Contractor's Authorisation:

This Authorisation signifies that the rescue plan component of the Confined Space entry has been completed and that confined space entry / work is authorised to commence in accordance with the Permit Request.

Name: ..... Signature: ..... Date: ..... Time: .....

Rescue Team Personnel

I the undersigned hereby acknowledge that I understand my role, the procedures, control measures and precautions to be observed with the rescue plan for this confined space. I will comply with these requirements at all times and report any new/unforeseen hazard that presents a risk to the safety of all personnel involved with this task.

Sign on				Sign Off		
Print Name (First & Last)	Date	Time	Signature	Date	Time	Signature

HYUNDAI ENGINEERING & CONSTRUCTION

Confined Space Rescue Plan

ساتورب satorp

Description of Space
Include location of Entry Permit Supervisor and Stand by person:

Diagram of Space
Show locations of all personnel involved in task:

HYUNDAI ENGINEERING & CONSTRUCTION | **Confined Space Rescue Plan** | ساتورب satorp

ON SITE RESCUE

The On Site Rescue Plan is part of the Confined Space Entry Permit and is based on the assessment of hazards in the space.

Prior to entry and/or work in the Confined Space:

- The CSES will ensure that the on-site rescue plan for the confined space has been completed and that all the rescue equipment identified in the plan is available to effect a rescue in the confined space.
- The CSES will ensure that an adequate number of appropriately trained personnel (as documented in the rescue plan) are available for immediate implementation of the rescue if so required.
- The CSES will ensure that all personnel in the rescue team, understand and know their roles and responsibilities and have signed the rescue plan prior to any personnel entering the confined space. Ensure everyone is aware of the evacuation alarm.
- The Stand by person must establish communication with all workers (inside and outside of the confined space) using the means described in the rescue plan.

On entry and while working in the Confined Space:

- The Stand by person who is stationed outside and near the entrance to the confined space as shown in the rescue plan, remains in constant communication with all workers inside the confined space.
- The Stand by person must be notified immediately if an entrant recognises:
  - Unusual action or behaviour
  - An unexpected hazard
  - An unsafe act
  - Detects a condition prohibited by the permit
- Personnel must exit the confined space as quickly as possible, when:
  - An order to evacuate is given by the Entry Permit Supervisor or the Stand by person
  - An entrant recognises a sign or symptom of exposure
  - An unacceptable condition arises
  - An evacuation alarm is activated

In the event of a confined space rescue:

- The CSES or the Stand by person **do not** enter the confined space but immediatelysummons a rescue response from the on-site rescue team. A nominated person must inform emergency services immediately if required. If injured person is able to be extracted, assess the persons injuries and provide assistance and first aid as necessary.

Attachment 4 – Confined Space Entry Checklist

Confined Space Entry Checklist

Vessel/Equipment/Confined Space ID:	Entry Date:

#	Requirement	Yes	N/A
1.	Confined space entry procedures/instructions provided and available		
2.	Area barricaded and has warning signs posted		
3.	Electrical sources isolated		
4.	Process piping/equipment isolated		
5.	Hydraulic/pneumatic and other energy sources isolated		
6.	Lockout and hold tag procedures followed		
7.	Hot/cold work permit completed		
8.	Confined space entry permit completed		
9.	Atmosphere tested for % oxygen (O_2)		
10.	Atmosphere tested for % LEL		
11.	Atmosphere tested for hydrogen sulfide (H_2S)		
12.	Atmosphere tested for carbon monoxide (CO)		
13.	Atmosphere tested for other gases (e.g., CO), identify:		
14.	Gases/chemicals purged, flushed, vented		
15.	Continuous gas testing performed		
16.	Mechanical ventilation provided		
17.	Appropriate personal protective equipment (PPE) provided and used		
18.	Appropriate respirator(s) (e.g., SCBAs) provided and used		
19.	Full-body harness provided and used by each entrant		
20.	Appropriate lighting equipment provided		
21.	Rescue service notified of confined space entry operations		
22.	Rescue equipment (e.g., hoist) available		
23.	Fire extinguisher(s) available at designated entry points		
24.	Standby man continuously present during confined space entry		
25.	Standby man has necessary PPE		
26.	Communications equipment for standby man and entrants provided		
27.	Entry log sheet available at designated entry points and used		

Issuer Name, Signature, Badge #	Receiver Name, Signature, Badge #	Time/Date:

Note: This checklist does not replace the mandatory *Hazard Analysis Checklist* that is part of the confined space entry permit issuance process, as required by GI 2.100, *Work Permit System*. This checklist may be used to verify that all required aspects of the confined space entry plan have been implemented prior to beginning the work. If used, the completed checklist shall remain with the Confined Space Standby Man on site after the joint site inspection is complete.

Attachment 5 – Confined Space Entry / Exit Log

HYUNDAI ENGINEERING & CONSTRUCTION	CONFINED SPACE ENTRY / EXIT LOG	Permit No.: / Date:
CONFINED SPACE ENTRY PERMIT NO.		LOCATION

STANDBY MAN WATCH INSTRUCTIONS

You should be thoroughly familiar with the following duties when you assume the responsibilities of standby for a person(s) working inside a vessel or confined space.

YOUR PRIMARY RESPONSIBILITIES ARE:
The safety of personnel working in the vessel or confined space.

- Maintaining the conditions and requirements listed on the work permit.
- Evacuating the vessel if you observe any condition which you considered hazardous.
- Getting help if an emergency develops.

NEVER ATTEMPT TO ENTER THE VESSEL OR CONFINED SPACE, EVEN IN AN EMERGENCY.

THE CIRCUMSTANCES AND CONDITIONS OF THE JOB WILL DETERMINE THE SAFETY REQUIREMENTS AND WHAT YOUR STANDBY DUTIES ARE. HOWEVER, THE FOLLOWING DUTIES ARE BASIC TO ALL JOBS:

- Do not leave your assignment while personnel are inside the vessel or confined space.
- (The only exception is to get help in an emergency). If other duties require you to leave your standby post, have all personnel evacuate the enclosure.
- If you have any questions regarding your job, check with your foreman.
- BE ALERT, and try to anticipate and / or prevent any conditions that could be hazardous.
- Prevent interference of air lines and / or lifelines.
- If you are required to have respiratory equipment and lifelines, be sure you know how to use this equipment.
- Upon completion of the job, clean and return all special equipment to its original location.

	Name	Badge No.	Telephone No.	Date
STANDBY MAN				
WORK PERMIT RECEIVER				

AUTHORIZED ENTRANTS		Location	

Name	Company	ID No.	Date	Time In	Time Out	Time In	Time Out	Time In	Time Out

Attachment 6 – Equipment Ventilation Plan

HYUNDAI ENGINEERING & CONSTRUCTION

ساتورب satorp

AMIRAL PROJECT PKG-4

Equipment Ventilation Plan

Plant:	Date: Date-Month-Year
Equipment Tag Number :	
Total Volume (V) of Equipment (m3) :	

Individual Capacities of Air Circulation Equipment's:

Sr. No	Equipment/Blower Type	No. of Equipment's	Capacity (m3/hr.)
1.			
2.			
3.			
4.			
5.			

Total No. of Equipment's =
Total Capacity (C) in m3/hr. =

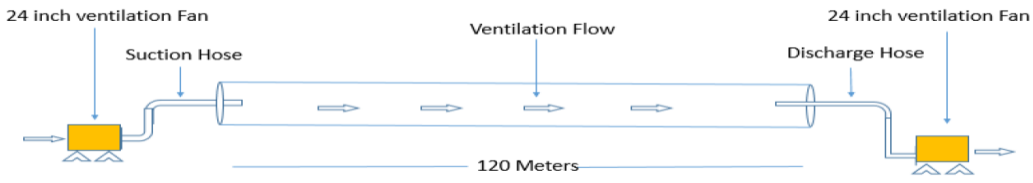
Ventilation Calculations:

Ventilation Rate in cycles per hour (R)= $\frac{C}{V}$ =

Note: The minimum time required to achieve adequate ventilation shall be 03 Minute/Cycle or 20 Cycles/hour.

Equipment Sketch:

68 inch internal lamination ventilation plan



- Please Attach Equipment drawings with proposed ventilation equipment location.

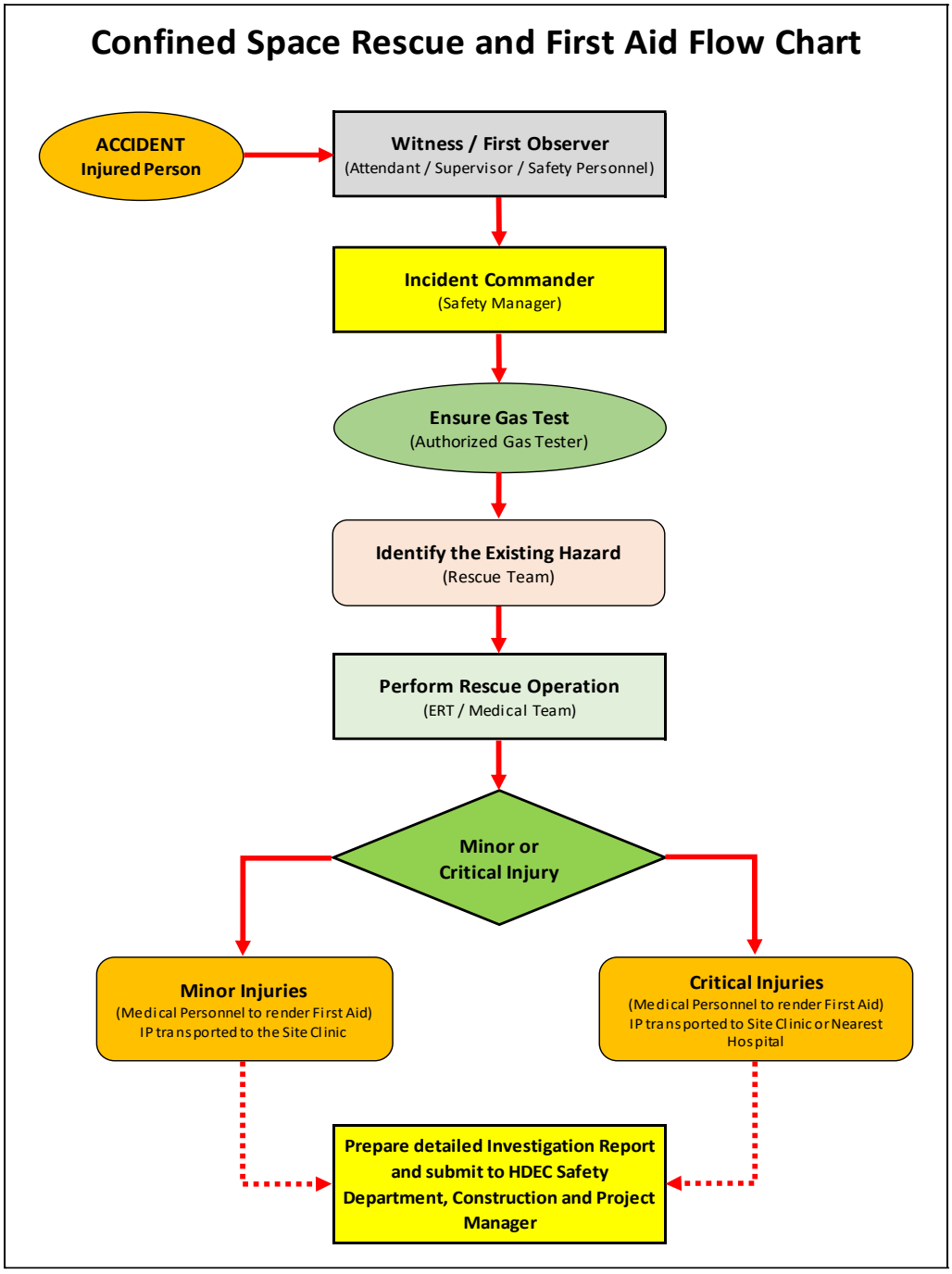
	Name	Signature	Date
Prepared by :			
Approved by:			
Acknowledged by :			

Attachment 7 – Confined Space Entry Equipment

Air Mover

Multi Gas Detector

Attachment 8 – Confined Space Rescue and First Aid Flow Chart



Attachment 9 – Confined Space Rescue Equipment

Rescue Tripod

Full Body Harness

Rescue Spine Board

Rescue Rope

Rescue Basket Stretcher

Paraguard Stretcher