Confined Space

Purpose

The purpose of this standard practice is to provide the basis for safe entry, work in, and rescue from confined spaces.

Scope

The scope of this standard practice applies to all Marathon Los Angeles Refinery (LAR) employees and contractors working in this refinery.

Records Retention

Printed copies of this document should not be retained more than 12 months. Any revision to this document will be retained a maximum of 10 years following the revision.

Table of Contents

1.0 References

1.1 Refining References

The table below lists the Refining References used with this document.

Number	Description
HSS-008	Control of Hazardous Energy
HSS-201	Safe Work Permit
RSP-1121-010	Blinding and Energy Isolation
RSP-1121-020	Safe Entry into Inert Atmospheres
RSP-1128-000	Safe Work Permit
RSP-1706-000	Lightning Safety
SAF-4005	Confined Space Entry

1.2 Industry References

The table below lists the Industry References used with this document.

Number	Description
American Society of Safety Engineers (ASSE)	
ASSE Z117.1	Safety Requirements for Confined Spaces
American Petroleum Institute (API)	
API RP 2016	Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks
API PUBL 2026	Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service
API STD 2015	Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks
API STD 2217A	Guidelines for Safe Work in Inert Confined Spaces in the Petroleum Industry
National Fire Protection Agency	
NFPA 350	Guide to Safe Confined Space Entry and Work.

1.3 Regulatory References

The table below lists the regulatory references used with this document.

Number	Description
29 CFR 1910.146	Permit Required Confined Spaces
29 CFR 1910.147	Control of Hazardous Energy (LOTO)
29 CFR 1910.119	Process Safety Management
29 CFR 1910.1200	Appendix E, Hazard Communication Standard
29.CFR 1910.134	Respiratory Protection
29 CFR 1926 Subpart AA	Confined Spaces in Construction
29 CFR 1926.57	Ventilation
Title 8, California Code of Regulations	Sections 5157, 5158, 8410, 8424, 8428, and 8437

1.4 Terms

The following terms are used in this document:

- Acceptable Entry Condition
- Attendant
- Authorized Entrant
- Barrier
- Blinding or Blanking
- Competent Person
- Confined Space
- Control
- Controlling Contractor
- Early-Warning System
- Emergency
- Engulfment
- Entry
- Entry Employer
- Entry Permit
- Entry Rescue
- Entry Supervisor
- Hazard
- Hazardous Atmosphere
- Host Employer
- Hot Work
- Immediately Dangerous to Life or Health (IDLH)
- Inerting
- Isolation or Isolate
- Limited or Restricted Means for Entry or Exit
- Line Breaking
- Lockout
- Lower Explosive (LEL)
- Monitor or Monitoring
- Non-Entry Rescue
- Non-Permit Confined Space
- Owning Department
- Oxygen Deficient Atmosphere
- Oxygen Enriched Atmosphere
- Permit Required Confined Space
- Permit Required Confined Space Program
- Physical Hazard
- Prohibited Condition
- Qualified Person
- Representative Permit Space
- Rescue
- Rescue Service
- Retrieval Systems

- Safe Work Permit
- Serious Physical Damage
- Tagout
- Test or Testing
- Ventilate or Ventilating

Reference: For details, see Appendix A: Terms and Definitions.

2.0 Roles and Responsibilities

2.1 MPC LAR Role

In order to comply with the 29 CFR 1926 Subpart AA and to provide clarity, MPC will assume the role of both Host Employer and Controlling Contractor in all Confined Space Entries. As such, MPC will be responsible for assigning an Entry Supervisor identified on the Safe Work Permit (SWP), who will be responsible for overall entry operations.

Reference: For additional guidance, see **Appendix B**.

Roles	Responsibilities
Attendants	**(a)** Consults the Safety Data Sheets (SDS) as necessary. **(b)** Ensures that a Safe Work Permit has been issued for the confined space assigned. **(c)** Makes certain that the Safe Work Permit – is signed by the Owning Department Representative, – identifies the Confined Space Entry Supervisor, – lists the current date, time, and location, – is posted at the entrance of the confined space, – specifies continuous air monitoring, and – has current atmospheric test/air monitoring results recorded on it. **(d)** Remains outside the permit space at all times during entry and work operations. **(e)** Ensures an occupied confined space is never left unattended. **(f)** Maintains communication (e.g., voice, rope signals, radio, visual observations, etc.) with the Entrant to

	monitor the Entrant's status. **(g)** Ensures an accurate count of all Entrants by name and time in and out of the confined space. **(h)** Checks that Entrants meet the Personal Protective Equipment (PPE) requirements as required by the Confined Space Entry Permit. **(i)** Reviews the requirements and conditions set on the Safe Work Permit and signs on the Safe Work Permit roster. **(j)** Must be familiar with and capable of understanding what the last material in the confined space was and how it enters the body. The attendant must also be able to recognize potential confined space hazards, signs and symptoms of exposure (including possible behavior effects of hazard exposure), and consequences of exposure. **(k)** Observes activities inside and outside the confined space to determine if it is safe for Entrants to remain in the space. **(l)** Keeps lifelines orderly, untangled, and connected securely to a retrieval device or anchor outside the space, if lifelines are required. **(m)** Must be trained on all applicable atmospheric monitoring equipment that will be used. **(n)** Orders Entrants to evacuate the permit space immediately when – a condition is observed which is not allowed in the Safe Work Permit, – a behavioral effect of hazard exposure in an Entrant is detected, – a situation is detected outside the space, which could endanger the Entrants, – an uncontrolled hazard is detected within the space, – Attendant must leave the monitoring location or is unable to perform required duties, – the plant alarm system is activated, or – the time limitation on the atmospheric testing has

	expired. **(o)** Summons rescue and other emergency services when Entrants need assistance. **(p)** Performs non-entry rescues. **Note:** The Attendant is not required to have the training of personnel that would perform entry rescues. If a rescue retrieval system to perform non-entry rescues is required, the Attendant needs to be trained and capable of using that equipment. **(q)** Does not allow unauthorized persons to enter the confined space. – Advises unauthorized person that they must exit immediately if they have entered the permitted space. – Informs the Authorized Entrant(s) and the entry supervisor if unauthorized person(s) have entered the permit space. **(r)** Observes the continuous monitor frequently to be certain the atmosphere remains safe. **(s)** Are not to be assigned any duties other than monitoring the confined space atmosphere and activities in that atmosphere. **Note:** They can fire watch or hand/lower work materials down to Entrants, but not perform duties, which interfere with their Attendant duties. **(t)** Notifies appropriate personnel of any problems involved with the confined space entry. **(u)** Ensures that the Safe Work Permit is maintained at the job site during the entry operation.

Roles	Responsibilities
Servicing Group (Contractor /MPC Employees)	**(a)** Must follow all MPC, regulatory standards and for contractors, their own contractor company safety procedures. **(b)** Uses and maintains all safety and air monitoring equipment in compliance with manufacturer's recommendations. **(c)** Ensures Entrant's representative informs the Owning Department Representative when they have completed their entry and completes the debriefing section on the Safe Work Permit. **(d)** Must be certified by their employers to have requisite training and experience. **(e)** During multi-craft work, the crafts creating any hazards must properly notify Entry Supervisor and take measures to evacuate the space as necessary so that corrective action can be taken to mitigate hazards. **(f)** Returns Safe Work Permit and sign-in/sign-out sheets to the Owning Department. **(g)** Removes the "field copy" of the Safe Work Permit and turns it over to the
Servicing Group (Contractor/ MPC) Supervisors	**(a)** Informs MPC representative of any hazards encountered during the entry. **(b)** Verifies that the specified conditions on the Safe Work Permit are adequate and have been met and are understood and followed. **(c)** Informs the MPC representative or other authorized personnel if and when the nature of the job changes the conditions under which the confined space entry was originally authorized. **(d)** Ensures that Attendants are competent with all equipment they are required

Authorized Entrants	**(a)** Knows entry hazards, including mode, signs, symptoms, and consequences of exposure. **(b)** Follows Safe Work Permit requirements as well as other appropriate confined space entry work practices. **(c)** Complies with the requirements and conditions set forth on the Safe Work Permit. **(d)** Exits from the space immediately when – requested by the Attendant or Entry Supervisor, – a prohibited condition exists, – a change in behavior is detected, – there are warning signs or symptoms of exposure, – a situation takes place outside the space that endangers entry, – there is an uncontrolled hazard inside the space, – the Attendant leaves, or – the plant alarm is activated. **Note:** When a hazardous condition is suspected, the Safe Work Permit should be revoked, and the Owning Department Representative notified. **(e)** Exits the confined space and notifies the Attendant or other appropriate personnel when a prohibited condition exists or when there are any warning signs or symptoms of exposure. **(f)** Maintains communication (for example, voice, rope signals, telephone, radio, visual observation, etc.) with the Attendant to enable the Attendant to monitor

Roles	Responsibilities
Entry Supervisor **Note 1:** An Entry Supervisor ***must*** be an MPC Employee and identified on the Safe Work Permit anytime MPC or contractor personnel are in a Permit Required Confined Space. **Note 2:** MPC employees may only sign as one of the Required Signatures in Section V of the SWP.	**(a)** Coordinates entry operations when more than one group will enter the confined space. **(b)** Ensures entry operations remain consistent with the Safe Work Permit and acceptable entry conditions are maintained. **(c)** Verifies that Entrants and Attendants understand the scope, requirements, and limits of the work defined in the Safe Work Permit. **(d)** Reports, at the end of entry operations, any hazards confronted or created during entry. **(e)** Knows the hazards that may be faced during entry including the mode, signs, symptoms, and consequences of exposure. **(f)** Verifies by checking that – appropriate entries have been made on the Safe Work Permit, – all atmospheric testing/air monitoring specified by the Safe Work Permit have been conducted, – ongoing air monitoring required by the Safe Work Permit is being conducted as specified, and – all procedures, precautions, hazards, and equipment specified by the Safe Work Permit are in place. **(g)** Terminates the entry if all entry operations covered by the Safe Work Permit are complete. **(h)** Terminates entry if a condition not allowed by the Safe Work Permit arises in the area or in or near the confined space.
MPC /Contractor Coordinator Coordinators	Apprises the Servicing Group of any precautions or procedures that have been implemented to protect employees in or near the confined space. (e.g., planning coordinators, execution specialist etc.)

Roles	Responsibilities
Owning Department	**(a)** Knows the confined space hazards including information on the mode and the consequences of exposure. **(b)** Verifies that MPC's section of the Equipment Isolation List (EIL) is complete and signed. **(c)** Identifies potential hazards associated with the confined space. **(d)** Specifies the testing and precautionary measures required to ensure the safety of the entry and the work to be done. **Reference:** For contaminant thresholds and conditions, see Appendix Fhttp://cbgrs20/red/copyout.aspx?lib_no=32&doc_no=1427 **(e)** Contacts the Safety Department for assistance, as necessary. **(f)** Reviews requirements and signs Safe Work Permits for all entries. **(g)** Ensures Attendants have adequate communications methods with both Entrants and rescue services. **(h)** Provides appropriate instructions for preparation of the space for entry including cleanup and isolation. **(i)** Ensures that the Safe Work Permit is maintained at the job site during the entry operation. **(j)** Validates that Safe Work Permit conditions are acceptable, signs the Safe Work Permit and helps enforce Safe Work Permit conditions. **(k)** Ensures adequate Attendant personnel are present and that proper emergency/rescue equipment and other personal protective equipment are specified by the Safe Work Permit. **(l)** Ensures that Rescue Team services are available within the refinery, and they have been notified that they are assigned rescue duties. **(m)** Coordinates through the Entry Supervisor that the specified conditions on the Safe Work Permit have been satisfied. **(n)** Notifies direct Supervision of any problem involved with the confined space entry. **(o)** Cancels and removes the Safe Work Permit when the work is completed or if a prohibited work condition occurs. **(p)** Ensures that required atmospheric testing is conducted prior to entry, as required. **(q)** Ensures that air-monitoring equipment (e.g., LEL/O2 meters, gas monitor, etc.) has been bumptested/calibrated and is properly maintained per manufacturer's recommendations

	(r) Ensures that all energy isolation requirements pursuant to HSS-008 have been satisfied. (s) Informs the confined space entry work party of any area or operational conditions that may impact the confined space entry operation (e.g., nearby hot work, sewer draining operations). (t) Communicates in a timely manner to the Entry Supervisor the existence, location and potential hazards of each Confined Space (e.g., Joint Job Site Visit). (u) Addresses mechanical integrity issues relative to the confined space prior to entry (e.g., tank roof metal thickness, stability of refractory). (v) Ensures a sign is posted such as "Danger – Permit Required Confined Space Do Not Enter" or a similar barrier as soon as the confined space is opened. (w) Attaches a copy of the rescue team list to the safe work permit, (x) Completes the debriefing section on the Safe Work Permits. (y) Coordinates entry operations with the contractor, nearby operations, and any MPC employees working in or near the confined space.

Roles	Responsibilities
Rescue Service (Facility Emergency Response Team)	**(a)** Performs assigned rescue functions. **(b)** Performs ***at least one*** confined space rescue drill every year. **(c)** Ensures that confined space rescue equipment is maintained and ready for immediate deployment.
Safety Department (Safety and Health)	**(a)** Develops, administers, and updates the local confined space procedure/work instructions. **(b)** Ensures that at least one rescue team member is currently certified in first aid and CPR. **(c)** Reviews requirements and authorizes initial Safe Work Permits involving confined spaces. **(d)** Conducts specific testing as requested by Owning Department. **(e)** On ***at least an annual basis***, reviews the Safe Work Permits to evaluate the overall confined space program effectiveness, and revises the program to correct any deficiencies found prior to authorizing subsequent entries. Examples of circumstances that may indicate a deficiency requiring a revision to the confined space program include, but are not limited to: – any unauthorized entry of a permit required confined space, – detection of a CS hazard not covered by the permit, – detection of a condition prohibited by the SWP permit, – a near-miss, or injury occurs during entry, or – a change in use or configuration of a permit required CS. **(f)** Responsible for developing and completing the planning details of the confined space job, including the completion of the Confined Space Attendant Reference Sheets, to be included in the job packet: **(g)** Confined Space Attendant Reference Sheets will be developed for all Confined Spaces and include at the minimum: ➢ Unit Name, ➢ Equipment Name & Number, ➢ Picture of Equipment, ➢ Equipment Drawing (if available), ➢ Previous Material in Vessel (utilize the vessel SDS & decontamination procedure to populate), ➢ Signs and Symptoms of Exposure, ➢ Non-Entry/Fall Protection Plan, and ➢ Emergency Contact Information.

	(h) Confined Space Attendant Reference Sheets shall be posted at all active entry points (e.g., manways) to the Confined Space. **Note:** See **Appendix E** for Confined Space example Entry Template. **(i)** For excavations, the SWP may be utilized instead of the Confined Space Attendant Reference Sheet, provided all requirements outlined in item (g) above are addressed.
Training Department	Develops, implements, logs, and administers local training programs to ensure safe confined space entry and work **(a)** provides and or facilitates Owning Department training, and **(b)** maintains annual training certifications for the local rescue service personnel.

3.0 Facilitating Non-Entry Rescue

3.1 Retrieval Systems

3.1.1 Retrieval systems or methods are required whenever an Authorized Entrant enters a permit space unless the retrieval equipment would.

a. increase the overall risk of entry, or

b. not contribute to the rescue of the Entrant

3.1.2 The Rescue Team shall be involved in the determination of retrieval equipment increasing the overall risk of entry or unable to contribute to the rescue of the Entrant

3.2 Retrieval System Requirements

LAR will adhere to the following retrieval system requirements:

3.2.1 Each Authorized Entrant uses a chest or full body harness, with a retrieval line attached at the center of the Entrant's back near shoulder level, above the Entrant's head, or at another point which the employer can establish presents a profile small enough for the success removal of the Entrant.

3.2.2 The use of wristlets or anklets may be used in lieu of the chest or body harness if the employer can demonstrate that the:

a. use of a chest or full body harness is infeasible or creates a greater hazard, and

b. use of wristlets or anklets is the safest and most effective alternative.

3.2.3 Attach the other end of the retrieval line to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.

3.2.4 A mechanical device must be available to retrieve personnel from vertical type permit spaces more than 5 feet deep at a minimum of 4:1 mechanical advantage lifting-lowering system.

3.3 Examples of When Not to Use a Retrieval System

The following are examples of when not to use a retrieval system:

3.3.1 the space has obstructions or turns that prevent pull on the retrieval line from being transmitted to the Entrant,

3.3.2 an Entrant being rescued with the retrieval system would be injured because of forceful contact with projections in the space, or

3.3.3 the retrieval line cannot be controlled so as to prevent entanglement hazards with the equipment or with the airline for an Entrant using an air-supplied respirator

4.0 Written Confined Space Procedure

LAR will proactively identify all locations that meet the definition of confined space are permit required confined spaces.

4.1 Identifying Confined Spaces

Important:

4.1.1 A confined space that could be entered inadvertently must have a warning sign posted or a similar barrier (for example, vessel skirt, building crawl space).

4.1.2 A confined space that is opened must be clearly marked or labeled with a warning sign or a similar barrier on or near all confined space entry points until the space is closed.

Example of Warning Sign: "Danger – Permit Required Confined Space Do Not Enter."

4.2 Identifying the Hazard

4.2.1 When evaluating a confined space, identify all hazards.

Important Reference: For contaminant thresholds and conditions, see **Appendix F**

4.3 Control of Hazards and Safeguards

The table below describes hazard and safeguard controls.

Hazard/Safeguard	Control Description
Ventilation	When ventilation is required for control of acute atmospheric hazards: **(a)** Use ambient air to bring the confined space atmosphere to safe levels. **(b)** Use a compressor or dedicated system to supply the air movers. **(c)** Attendants shall require all occupants to immediately leave the confined space when ventilation systems fail. **(d)** The Owning Department Representative, Entry Supervisor and Attendant ensure that the inducted air does not represent a health concern from sources such as vehicle exhaust or process emissions. **(e)** Bonded forced air ventilation devices are required. **Important:** Do not supply air movers from the plant air system if plant air system is backed up by nitrogen or other contaminant gas.
Blinding and Energy Isolation	Refer to **HSS-008**

Multiple Compartment or Coupled Vessels	When multi-compartment or coupled confined spaces are to be entered, additional precautions are as follows: **(a)** Atmospherically test the entire space. **(b)** The Owning Department Representative and Entry Supervisor shall verify that the space has been isolated and that engulfment, mechanical, and internal configuration hazards have been addressed. **(c)** Position an Attendant at each active entrance/exit location (e.g., Manways, at internal manways of floating roof tanks when work is taking place above and below, work inside cyclones inside the Regen, etc.) **Note:** It may not be necessary to have an Attendant at each entrance/exit provided they can adequately monitor the Entrants. **(d)** Prepare a single Safe Work Permit for the entire space unless the confined space warrants otherwise (e.g., a catalytic regenerator, large vessel separated by bulkhead, etc.). **(e)** Coordinate, maintain, and control sign-in/sign-out sheets for multiple active entrance/exit locations by an assigned Attendant to ensure that all Entrants are accounted for at the completion of entry operations. **(f)** The alerting device to warn entrants to evacuate a confined space due to an unsafe condition must be sufficient to alert all entrants. The alerting device selected shall consider the size and/or configuration of the confined space and the work being performed in the confined space. The standard compressed air or hand pumped air horns may not be sufficient to alert entrants of an evacuation. In these situations, other more effective or louder alerting systems must be used (e.g., CS Monitoring System with audible and visual alerts, strobe light, etc.). **Note:** Whistles shall not be used, as they are utilized to signal crane lifts.

Hazard or Safeguard	Control Description
Atmospheric Testing / Monitoring	**(a)** Test every permitted space atmosphere for LEL, oxygen, carbon monoxide, hydrogen sulfide and toxic gasses as determined necessary by the Owning Department. **(b)** If the confined space has to be entered to complete a check of the atmosphere, perform testing from the outside of the space as thoroughly as possible. A Safe Work Permit will be required to be issued before the space can be entered. **(c)** Calibrate, use, and maintain testing equipment per the manufacturer's recommendations. **(d)** Give Entrants (MPC and contractor personnel) the opportunity to witness monitoring. **(e)** For hot work, ensure the atmosphere is 0% LEL **(f)** For cold work, ensure the atmosphere is less than or equal to 10% LEL. **(g)** The atmosphere within the Confined Space shall be continuously monitored. The Owning Department must clearly indicate the sampling point in the space on the Safe Work Permit. The sampling point must be representative of the breathing zone of Entrants. **Note:** Continuous monitoring is not required when the monitors are not commercially available for a specific toxic substance (e.g., Lead, Hexavalent Chromium, Asbestos, etc.). If continuous monitoring equipment is not commercially available, periodic monitoring must be conducted for the hazard(s) at intervals adequate to detect potential changes. **(h)** Conduct testing for the following materials in the order listed: – oxygen, – flammable gases and vapors, – potential toxic contaminants, and – other potential hazards as necessary, such as radiation, explosives, combustible dust, heat stress, pH, etc. **Important:** The indicated order is important. Some test instruments for flammable gases and vapors do not work properly if sufficient oxygen is not present and some test instruments for toxic materials do not work properly in a flammable atmosphere. **(i)** Ensure that all instruments for testing the atmosphere in a confined space are direct reading. **(j)** Ensure continuous monitoring instruments are direct-reading devices that have a visual readout and audible alarm that can be set to alarm at contaminant threshold and condition limits. **Reference:** For contaminant thresholds and conditions, see ***Appendix F*** http://cbgrs20/red/copyout.aspx?lib_no=32&doc_no=1427 **(k)** If direct reading instrument is not capable, use industrial hygiene monitoring instrumentation.

Hazard or Safeguard	Control Description
Pre-Entry Atmospheric Testing	**(a)** All confined spaces are considered hazardous atmospheres until pre-entry testing and verification demonstrates otherwise. **(b)** Ensure a Safe Work Permit authorizing Confined Space Entry is processed prior to entry into a confined space. **(c)** Conduct the initial atmospheric testing from the outside with the ventilation turned off. **(d)** Provide an opportunity for each Authorized Entrant or that employee's representative to witness the atmospheric monitoring of the confined space. Ensure the ventilation is off long enough (at least 15 minutes) to assure steady state conditions. **Note:** The time varies depending on the size and configuration of the space. **(e)** When the initial atmospheric testing results are acceptable and representative, determine if the work to be done in the space will introduce additional hazards. **Note:** Based upon the configuration of the confined space, it may be necessary to enter and perform additional testing to ensure that contaminants are below acceptable levels. Conduct this entry testing after all other conditions of the Safe Work Permit are satisfied.
Continuous Monitoring	**(a)** The atmosphere within all Confined Space shall be continuously monitored. **(b)** Continuous monitoring for a confined space entry is required for oxygen concentration, flammable concentration (LEL), and other toxics (as required). **(c)** The Owning Department **must** clearly indicate the sampling point(s) in the confined space on the Safe Work Permit. The sampling point must be representative of the breathing zone of Entrants. **Note:** Consideration must be given for confined spaces inside confined spaces, which may still require personal multi-gas monitors.
Re-testing	**(a)** Perform retesting for oxygen, flammable gases, and toxic vapors prior to re-entry after – an absence of two hours or more, or – an event that may have changed conditions in the space. – A unit evacuation **(b)** Consider retesting for other hazards on a case-by-case basis and specified on the Safe Work Permit, if required. **(c)** Retest confined spaces at least midway through the maintenance shift (>= 4hours). **(d)** Provide an opportunity for each Authorized Entrant or that employee's representative to witness the atmospheric monitoring of the confined space.
Oxygen	**(a)** Determine the oxygen concentration in the atmosphere by testing with an oxygen analyzer. **(b)** The oxygen level must be between 19.5% and 23.5% to be considered safe for confined space entry. – LAR recognizes atmospheres under 19.5% as IDLH atmospheres and refers all work that meets this requirement to **RSP-1121-020** for all Inert Confined Space Entries.

Hazard or Safeguard	Control Description
Flammable Vapors	**(a)** Atmosphere must be less than 10% LEL on a combustible gas detector before entry is permitted (non-inert). **(b)** For hot work, the atmosphere must be 0% LEL. **(c)** For cold work, the atmosphere must be between 1-10% LEL. ➢ **Important:** Supplied Air is required for all cold work performed where the LEL levels are between 1-10%. **Note:** A LEL meter reading may drift 1-2%. Contact the Safety Department if the LEL meter will not stabilize at 0% LEL.
Toxic Materials	**(a)** Conduct tests when there is a possibility of toxic materials being present. **(b)** When the Owning Department is unable to perform the tests, the Owning Department or Area Supervisor contacts the Safety Department for assistance. **(c)** Any concentration in excess of the recognized exposure limits renders the atmosphere hazardous. **Excess Concentration Examples:** Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL). **Reference:** For contaminant thresholds and conditions, see ***Appendix F***
Combustible Dusts	**(a)** Airborne combustible dusts (for example, sulfur) in high enough concentrations can be explosive. **(b)** Use ventilation, utilizing wet methods, or other means as needed to control combustible dusts in confined spaces as to not create an explosive atmosphere.
Non-Isolated Engulfment Hazards	**(a)** Any non-isolated engulfment hazard (e.g. Catalyst) shall have an early-warning system that continuously monitors for the non-isolated engulfment hazard. **(b)** The system shall alert Authorized Entrants and Attendants in sufficient time for the Authorized Entrants to safely exit the space. **Example:** Remote Camera Monitoring System for Catalyst removal with Entrants attached to lifelines. Non-Isolated Sewer Entry with a monitor upstream to monitor water flow. **Note:** See **RSP-1121-020** for all Inert Confined Space Entries.
Falling Object Hazards	Any falling object hazards (e.g., catalyst, coke, refractory, etc.) that may be encountered during removal of these materials should be identified during the job planning process and discussed as a part of the safe work permitting process. Each falling object hazard should be eliminated or mitigated to ensure a safe work environment.

5.0 Written Safe Work Permit Systems Requirements

5.1 Written Safe Work Permit

5.1.1 Prior to any entrance into any confined space, ensure the confined space section of the Safe Work Permit is written according to **HSS-201**

5.2 Records Retention

5.2.1 Retain expired Safe Work Permits per the "Corporate Records Retention Policy."

5.3 Job Completion

5.3.1 Servicing department (MPC or Contractor) shall ensure the job completion is communicated to the Owning Department Representative and the Rescue Team via (Radio C2) and documented in Section VI of the safe work permit (Return of equipment/work area – job completeness with signatures

5.3.2 Contractor's Entrant's representatives must inform the Owning Department when they have completed their assigned task in the confined space and document debriefing on the back side of the soft copy of the permit.

6.0 Rescue and Emergency Services

6.1 Rescue and Emergency services requirements are the following:

6.1.1 Only trained personnel may enter a confined space for rescue purposes. Non-entry rescue may be performed provided the rescuer is trained to properly use such equipment.

6.1.2 As per **RSP-1121-020**, MPC employees will not enter Inert Confined Spaces.

6.1.3 An adequate number of rescue personnel must be available within the refinery during an active confined space.

Note: Adequate number is a minimum of 2/2=4 ERT personnel

6.1.4 MPC employees who are designated Confined Space Rescue Team Members Must:

- (a) be trained in basic first aid and CPR, and
- (b) Practice making permit space rescues, in representative permit spaces, before attempting an actual rescue in refining/process type Confined Spaces, and at least once every 12 months, by means of simulated rescue (e.g., remove dummies, manikins, or actual persons).

6.1.5 Emergency/rescue personnel

- (a) operate according to the site emergency response plan, and
- (b) can only enter the confined space (with unknown or hazardous atmospheres) when equipped with
  1) SCBAs, or
  2) Positive-pressure airline respirators equipped with escape bottles and other appropriate personal protective equipment and
  3) Only when an attendant is stationed by the confined space.

6.1.6 Rescue services will handle the rescue under guidance of the

- (a) Fire Chief,
- (b) Senior ERT member, or
- (c) Rescue Team Leader.

6.1.7 SDS's will be made available to medical facilities treating exposed employees, if applicable.

6.1.8 If MPC LAR utilizes a third-party Rescue Contractor, MPC LAR must

- (a) Evaluate the prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazards identified.
- (b) Evaluate the prospective rescue services ability with
  1) Rescue-related tasks and equipment,
  2) Rescuing entrants from the permit space or types of permit spaces identified, and
  3) Equipment functioning properly
- (c) Select the rescue team or service from those evaluated that
  1) Has the capability to reach the victim(s) within a time frame that is appropriate for the CS hazards,

2) Is equipped for, and proficient in, performing the needed rescue services, and
3) Agrees to notify the employer immediately in the event that the rescue service becomes unavailable.

(d) Inform each contract rescue team or service of the potential hazards at the site.

(e) Allow the rescue team or service selected access to all permit spaces to develop rescue plans and practice rescue operations.

6.2 Emergency Rescue Equipment

6.2.1 For entries, at a minimum, ensure the following emergency rescue equipment is immediately available at the refinery:

a. hoisting device to extricate personnel from the confined space,

b. extra and independent supplied air respirators as required by the scope of the work and the rescue pre-plan,

c. harnesses, ropes, tools, etc., needed to extricate personnel,

d. medical response equipment for use by trained MPC medical personnel,

e. stretcher and means to lower injured personnel to ground,

f. provisions for summoning assistance, and

g. PPE required for entry.

6.3 Confined Space Equipment

6.3.1 As the Host Employer, the MPC Owning Department Representative and/or Entry Supervisor must ensure the following equipment is in place and functioning as required prior to entry:

a. Testing and Monitoring Equipment,

b. Ventilation Equipment,

c. Communication equipment necessary for Attendant(s) assessing Authorized Entrant's status in confined spaces,

d. Personal Protective Equipment (PPE), if feasible engineering and work-practice controls do not adequately protect the Authorized Entrant(s),

e. Lighting equipment

Important:

1) Lighting equipment shall be approved for ignitable/combustible properties for the potential hazards of the confined space (i.e., gases, vapors, dust).

2) Lighting equipment shall be sufficient to allow Authorized Entrants to see well enough to work safely and exit the space quickly in the event of an emergency.

3) Lighting equipment shall meet the minimum illumination requirement of 5-foot candles.

(f) Emergency egress lighting,

Important:

1) Emergency egress lighting shall be available as back-up to primary lighting in event the Confined Space loses primary lighting during an emergency. The Emergency Egress Lighting equipment shall be approved for ignitable/combustible properties for the potential hazards of the confined space (i.e., gases, vapors, dust). Lighting equipment shall meet the minimum illumination requirement of 5-foot candles.

2) For purposes of emergency egress lighting, a battery powered back-up lighting system shall be used when feasible. In the event a battery powered back-up lighting system is not feasible, a head lamp approved for the potential hazards of the confined space shall be worn on the hard hat. A hand-held flashlight is permitted in lieu of a head lamp in cases where welding protection equipment or other personal protective equipment prevents the use of a head lamp and in situations where only a portion of the entrant's body will pass through the opening into the Confined Space (e.g., exchanger).

3) Handheld flashlights and head lamps must be intrinsically safe.

(g) Barriers and shields to protect Authorized Entrants from hazards outside the space (e.g., Jersey Barrier for CSE along roadway).

(h) Ladders, needed for safe entry and exit by Authorized Entrants,

(i) Rescue equipment that is not supplied by the rescue service, and

(j)	Any other equipment necessary for safe entry into, safe exit from and rescue from permit required confined spaces.

7.0 Training and Auditing

The confined space entry training section applies to both MPC and Contractor employees

7.1 LAR will adhere to the following Training Requirements:

7.1.1	Owning Department Representative must complete initial Safe Work Permit training.
7.1.2	Train the confined space entry work party to perform their assigned duties as required by Federal and State regulations and Industry standards, see Reference section. a. **Examples of Work Party:** Attendants, Entrants, and Entry Supervisors
7.1.3	Training shall ensure that the employees possess the understanding, knowledge, and skills necessary for the safe performance of the duties assigned (e.g., Quiz, Test).
7.1.4	This training must result in an understanding of the following: a. hazards in the permit space and methods used to isolate, control or other ways to protect employees from these hazards, and b. dangers of attempting rescue for employees not authorized to do so.

Note: Contract companies are responsible for the training of their employees on the Federal and State regulatory requirements and industry standards considered to be Recognized And Generally Accepted Good Engineering Practices (i.e., RAGAGEP.)

7.2 Auditing

7.2.1	The Safety Department will perform an annual review of PRCSE Safe Work Permits per Federal and State regulations.

8.0 Contractors

8.1 Entering Confined Spaces

9.2.1 MPC shall inform contractors that confined spaces must only be entered after obtaining a Safe Work Permit that has been approved and signed.

8.2 Working with Hazards

8.2.1 In order to provide a safe work environment, inform the contractor via the Safe Work Permit of:

(a) hazards identified,
(b) precautions or procedures, and
(c) other operations nearby.

8.3 Debriefing

8.3.1 Conduct a debriefing via the Safe Work Permit regarding hazards confronted during the confined space and ensure this is communicated to Entry Supervisor.

9.0 Special Confined Space Situations

9.1 Inert Entries

9.1.1 Refer to RSP-1121-020

9.2 Sewer Entries

9.2.1 Sewer entry differs from other Safe Work Permit entries in that there rarely exists any way to completely isolate the space to be entered.
Exceptions: Plugging and ballooning with materials of construction that are compatible with the hazards.

9.2.2 Atmospheres may suddenly and unpredictably become lethally hazardous (engulfment, toxic, flammable, or explosive).

9.2.3 Additional hazard/risk assessment and advance planning are required.

a. Review the *Permitted Task List* and complete **Form C38** prior to performing the job.
b. All controls on the form must be met in order for the work to proceed.

Reference: See 5157. Permit-Required Confined Spaces, Appendix E-Sewer System Entry.

9.3 Floating Roof Tanks: Covered Internal Floater

9.3.1 The Owning Department must issue a Safe Work Permit.

Important: Under no conditions shall permission be given to enter a covered internal floater with a plastic, Petrex, aluminum or fiberglass roof while tank is in service or has product in it.

9.3.2 A Safe Work Permit may be issued for entry into a covered internal floater with a steel pan or pontoon roof if all of the conditions in the table below are met:

✓	**Requirement**
	The preference is that the pan be not more than 10 feet below the fixed roof, and in all cases, it should be as high as possible **Note:** This requirement may be waived if clean water only is in the tank (such as during hydrostatic test).
	All lines to or from the tank must be locked out/tagged out at the tank, unless approved by the Safety Department. Minimum isolation is an Unverified Single Valve Isolation – if this cannot be achieved a RSP waiver is required.
	All mixers must be shut off and locked out.
	When entering onto floating roof in tanks, use the listed respiratory protection, **(a)** for Class I flammable liquids (for example, gasoline), use a SCBA or supplied air respirator with five-minute escape provisions on ALL entries, and **(b)** as directed by the Entry Supervisor, for Class II liquids (for example, distillates) and hydro-test water.
	Use a winch or other rescue device with mechanical advantage equipped with fall protection capability when ascending and descending into the tank.
	Have Entrants wear a full-body safety harness and lifeline. If there is an entanglement hazard **(a)** the Entrants may remove the lifeline after reaching the pontoon or floating roof, provided one person stays at the bottom of the ladder with the lifeline as an observer for the others, and ***(b)*** the lifeline must be reattached before exiting back up the ladder. **Important:** A breathing apparatus harness is ***not*** acceptable as a full-body harness

	An SCBA or supplied air respirator must be available to the Attendant on the roof, if required. **Important:** The Attendant cannot use the SCBA or supplied air respirator for entry rescue purposes.
	An outside Attendant must be stationed on the top platform with immediate communications and non-entry rescue capabilities (radio, back-up person, etc.).
	Entrants shall not be allowed to descent onto an internal floating roof, which is out of floatation (sitting on its legs) until **(a)** the space below the roof has been opened and ventilated, **(b)** atmospheric testing has been conducted both above and below the open-top floating roof, and **(c)** conditions allow the issuance of a Safe Work Permit.
	Continuous monitoring by Entrants and Attendants.

9.4 Floating Roof Tanks: Open Top Floating Roof Storage Tanks

9.4.1 Adhere to the following open top floating roof storage tank requirements:

a. If required, the Safe Work Permit must be issued by the Owning Department.
b. Entry onto a storage tank's external-floating roof is a confined space.
c. Conduct a pre-job meeting with facility and contractor personnel which includes the following personnel to review the proposed work, potential hazards, entry conditions, and emergency plans:
    1) Designated Entry Supervisor,
    2) Owning Department Representative
    3) Entrant(s),
    4) Attendant(s), and
    5) Designated Rescuers.
d. Lock out/tag out all lines to or from the tank. If Unverified Single Valve Isolation cannot be obtained, a RSP waiver is required.
e. Shut off and lock out all mixers.
f. Prior to descent visually inspect the open-top floating roof from the platform for potential physical hazards and stability.

Important: Owning Department and Entry Supervisor must ensure the integrity of a floating roof has not been added to the thin roof report; If there are any doubts, contact the Inspection Department to ensure the metal thickness is within API specifications for personnel access.

g. Entrants shall not be allowed to descend onto an open-top floating roof, which is out of floatation (sitting on its legs) until
   1) the space below the roof has been opened and ventilated,
   2) atmospheric testing has been conducted both above and below the open-top floating roof, and conditions allow the issuance of a Safe Work Permit.

Important: Facilities may adopt a shortened or modified version of the Safe Work Permit for tasks of short duration such as gauging.

9.5 Tunnels

9.5.1 Tunnel entry differs from other Safe Work Permit entries, in that atmospheres may suddenly and unpredictably become lethally hazardous.

9.5.2 Additional hazard/risk assessment and advance planning are required.

9.6 Large, Complex and High Worker Density Confined Spaces

9.6.1 Additional hazard/risk assessment and advanced planning are required for very Large, Complex and High Worker Density Confined Spaces that have any of the following characteristics or scenarios:

a. 50 or more entrants simultaneously per shift,

Note: This is based upon all entrants/companies performing work in the space.

b. Confined Space Entry inside the Confined Space (e.g., work inside cyclones inside a regen vessel, large diameter piping between FCC and regen vessel), or
c. Complex scaffold systems which include seal decks that separate the Confined Space

9.6.2 The additional hazard assessment must be documented and consider at least the following:

a. Personnel (Entrant) accountability in the event of an emergency,
b. Personnel protection from falling debris, tools, and equipment,
c. Alerting systems that can be heard and seen by all entrants in the event of an emergency,

Note: Consider the noise levels when air movers and all work is going on in the CS.

d. Additional Fire Watches and Hole Watches (Attendant) stationed inside the CS,
e. Additional Fall Protection Requirements (e.g., Tripod System for internal aligned manways on trays greater than 12 inches, Fall Protection for work inside Cyclones inside the regen, adequate tie-off points on scaffolding),
f. Adequacy and quantity of access/egress locations based on the number of Entrants,
g. Complexity of air movement system(s) and any hazards the system itself would introduce to the CS,
h. Consideration of a CS Monitoring System that has Closed-Circuit TV (CCTV), air monitoring, audio & visual alarms and voice communication system,
i. Enhanced fire prevention/protection systems/equipment including charged fire hoses.

9.6.3 The Large, Complex and High Worker Density Confined Spaces Hazard Assessment Checklist (**Appendix C**) shall be completed when the Confined Space meets any one of the requirements above are meet. The Large, Complex and High Worker Density Confined Spaces Hazard Assessment Checklist will be completed by an MPC Safety Professional and MPC Maintenance Representative knowledgeable in the work scope.

9.7 Hot Work Inside Confined Spaces

9.7.1 Adhere to the following requirements for welding and cutting:

a. Provisions shall be made to ensure adequate ventilation for each person conducting Hot Work in the confined space. Cutting or welding operations must be performed such that an additional hazard to personnel is not created.

b. Mechanical ventilation shall be required when welding occurs inside of confined spaces. Certain large and/or open-air confined spaces (e.g., heaters, open tanks, excavations, etc.) may be exempt from this requirement provided there is adequate natural ventilation.

c. Precautions shall include an inspection of hoses and torches for leaks prior to use.

Note: An increase in oxygen and/or flammable gases could occur from leaking cutting torch(es) or hose(s).

d. A multi-gas continuous monitor is required in all Confined Spaces. The location of the sample hose must be representative of the Entrants breathing zone. Fumes can be created by cutting or welding on surfaces which are galvanized, contain chromium, or lead contaminated and may require additional respiratory protection or other control measures to limit personnel exposure.

e. When welding is suspended and the space is vacated for more than 15 minutes (e.g., lunch, breaks, shift change, etc.) all electrodes are to be removed from their holders and the machine turned off and/or disconnected from its power source.

f. If the hot work in the confined space involves the use of gas welding/burning and the work is stopped and the space vacated for more than 15 minutes (e.g., lunch, breaks, shift change, etc.),

1) torches and hoses must be removed, or

2) hoses (oxygen and fuel gas or inerting gasses) disconnected from the regulators.

g. Any gas cylinders used in welding or cutting process must be stored, staged, or located outside the vessel or confined space.

h. For use of air powered tools inside confined spaces, consider the effect on the vessel's atmosphere of introducing non-breathing air quality air into the vessel.

Note: Do not supply air movers from the plant air system if nitrogen is used for the back-up plant air system.

i. Fire extinguishers must be positioned in close proximity to all hot work operations inside the confined space.

j. Confined spaces that have a large quantity of combustible materials must have a charged fire hose or other water source available to immediately extinguish a combustible fire.

9.8 Refractory Work Inside Confined Spaces

9.8.1 Additional hazard assessment and advance planning are necessary to determine the refractory materials and potential work exposures (for example, pH, arsenic, free silica).

Important: Ensure Health & Safety Department is included in the hazard assessment prior to entry

9.9 Temperature Extremes Inside Confined Spaces

9.9.1 Confined space entry is not permitted if the dry bulb temperature exceeds 110°F inside the confined space.

Notes:

a. Notify Health when the temperature equals or exceeds 95°F.
b. Refer to HSS 303 Heat Illness Prevention regarding the High Temperature Program.
c. The use of the methods and measures to reduce heat related illness in the HSS 303 Heat Illness in conjunction with procedures that involve proactive employee feedback and Supervisor oversight.

9.9.2 Workers should be rotated as necessary to prevent heat stress.

9.9.3 When temperatures in the confined space exceed 70°F, consider heat stress prevention for workers entering the confined space and any personnel in protective clothing outside the confined space.

9.10 Inclement Weather Conditions

9.10.1 If lightning threatens or is active in the area, continuation of confined space activities shall be consistent with the requirements outlined in RSP-1706-000.

9.10.2 Confined space entry may resume

a. no sooner than 15 minutes after the last lightning strike, and
b. after lightning no longer threatens.

9.11 Multi Craft Work Coordination

9.11.1 In the event multiple crafts/employers will be working in the same confined space, all crafts/employers shall convene and utilize the Safe Work Permit as a means of developing and implementing procedures to coordinate entry operations. Coordination and procedural considerations must include:

a. Equipment preparation (e.g., equipment lines, valves, vessels, tanks), LOTO, electrical and general precautions pertaining to the entry,

b. Personal protective equipment,

c. Hot work precautions,

d. Communications,

e. Additional confined space precautions,

f. Atmospheric monitoring requirements, and

g. Identifying hazards of one group that may affect others and ensure protective measures are provided for others that may be affected.

9.11.2 All specific procedural requirements must be documented on the Safe Work Permit. Acknowledgement of the procedures by employees is verified through being listed on the Safe Work Permit. The Entry Supervisor must ensure all Entrants under their control understand these procedural requirements

Notes:

a. The Safe Work Permit, in addition to local safe work permit and confined space entry procedures, is the crafts/employees' procedure for executing safe entry into the confined space.
b. A Job Safety Analysis (JSA) will be used to enhance the procedure specified via the Safe Work Permit.

9.12 Reclassification of a Permit Required Confined Space to a Non-Confined Space

9.12.1 Tanks and excavations located outside of active/current process areas may be reclassified as non-confined spaces by the MPC Safety Department. Other types of confined spaces cannot be reclassified, including trenches. Although a reclassified space is no longer considered a permit required confined space, Safe Work Permits are required, per RSP-1128-000. However, the SWP does not need to indicate the Confined Space Rescue Team Members, Confined Space Attendants, and the section of the SWP for Confined Space Entry & the entry and exit log are no longer required.

9.12.2 The following are requirements for reclassification of a permit required confined space to non-confined space:

a. A meeting with an MPC Safety Representative, MPC Maintenance Representative, Servicing Group Representative, Owning Department Supervision and Excavation Competent Person (as needed) will take place at the job site to evaluate the Permit Require-Confined Space for reclassification. Their reclassification meeting will address the following items at a minimum:

9.12.3 **For Tanks:**

a. A door sheet (approximately 10' x 8') must be cut in the side of the tank.

b. The tank must be cleaned and free of residues and materials (e.g., pontoons, roof seals, roof legs and/or gauge poles

which are sealed to the floor and residues on the floor, walls and roof).

Note: Entry into pontoons will still require a confined space entry permit.

c. Continuous atmospheric monitoring is still required.
d. Additional precautions (e.g., PPE, additional continuous monitors, barriers, shields, lighting requirements, rescue equipment, etc.) will be determined during the reclassification meeting.

e. If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated, it may be reclassified as long as the hazards remain eliminated.

Note: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.

9.12.4 For Excavations:

a. The excavation must have a sufficient protective system (e.g., sloped, benched, or sheeting) and have at least one sloped vehicle ramp (i.e., large enough to support a full-size truck).

b. Excavations outside of active/current battery limits may be reclassified if the excavation does not have "limited or restricted means for entry or exit."

c. To achieve unrestricted entry or egress the excavation must have ladders or ramps every 25 feet along the perimeter.

d. Continuous atmospheric monitoring is still required.

e. If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated, it may be reclassified as long as the hazards remain eliminated.

Note: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.

9.12.5 Working in a Reclassified Non-Confined Space shall require the following:

a. A Notice to be posted at the job site (e.g., Tank entrance, Excavation entrance) once the space as been determined a Non-Confined Space. The Notice shall state the following:

b. Date & Time the space was reclassified, and

c. Individuals involved in making the reclassification determination.

d. For Tanks, continuous atmospheric monitoring is required inside the tank once it has been reclassified.

e. For Excavations, continuous atmospheric monitoring may be required in reclassified excavations based upon the work scope.

f. All entrants shall leave reclassified spaces any time an uncontrolled hazard arises.

g. Reclassified spaces that have been evacuated because of an uncontrolled hazard must be re-evaluated, to determine if they can remain reclassified as a non-confined space, by a representative of the MPC Safety Department before they can be re-entered.

Reference: See **Appendix D**

9.13 Pigging Operations inside Boilers or Furnace Fire Boxes

9.13.1 During pigging operations, entrants shall be allowed entry up to the point the tubes are ready to be pressurized. Once tubes are under pressure, entrants shall be held out of the space until one pass of the pig has been completed as a verification of tube integrity. When the tube is verified, entrants shall be allowed back into the space during pigging operations.

Appendix A: Terms and Definitions

Term	Description
Acceptable Entry Conditions	**Acceptable Entry Conditions means** the conditions that must exist in a permit space, before an employee may enter that space, to ensure that employees can safely enter into, and safely work within, the space
Attendant	**Attendant** is an individual stationed outside one or more permit spaces who assesses the status of authorized entrants and who must perform the duties specified in §1926.1209.
Authorized Entrant	**Authorized Entrant means** an employee who is authorized by the entry supervisor to enter a permit space.
Barrier	**Barrier means** a physical obstruction that blocks or limits access
Blinding or Blanking	**Blinding or Blanking means** the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.
Competent Person	**Competent Person means** one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.
Confined Space	**A Confined Space** • is large enough and so configured that an employee can bodily enter and perform assigned work, • is not designed for continuous employee occupancy, and • has limited or restricted means for entry or exit. **Examples of spaces that may have limited means of entry**: Tanks, vessels, towers, sewers, excavations four feet deep, vessel skirts, vaults and pits. **Note**: Typically, tank dikes are not considered confined spaces.
Control	**Control means** the action taken to reduce the level of any hazard inside a confined space using engineering methods (for example, by ventilation), and then using these methods to maintain the reduced hazard level. Control also refers to the engineering methods used for this purpose. Personal protective equipment is not a control.
Controlling Contractor	**Controlling Contractor** is the employer that has overall responsibility for construction at the worksite. **Note:** If the controlling contractor owns or manages the property, then it is both a controlling employer and a host employer.
Early- Warning System	**Early-Warning System** means the method used to alert authorized entrants and Attendants that an engulfment hazard may be developing. Examples of early-warning systems include but are not limited to: alarms activated by remote sensors; and lookouts with equipment for immediately communicating with the authorized entrants and Attendants.

Emergency	**Emergency means** any occurrence (including any failure of power, hazard control or monitoring equipment) or event, internal or external, to the permit space that could endanger entrants.
Engulfment	**Engulfment means** the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, crushing, or suffocation.
Entry	**Entry means** the action by which any part of a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space, whether or not such action is intentional, or any work activities are actually performed in the space.
Entry Employer	**Entry Employer** means any employer who decides that an employee it directs will enter a permit space.
Entry Permit	**Entry Permit (Permit) means** the written or printed document that is provided by the employer who designated the space a permit space to allow and control entry into a permit space and that contains the information specified in §**1926.1206** of this standard.
Entry Rescue	**Entry Rescue** occurs when a rescue service enters a permit space to rescue one or more employees.
Entry Supervisor	**Entry Supervisor means** the qualified person fulfilling responsibilities as outlined in Section 2.1 of this standard practice. The entry supervisor is the individual who has direct charge of the entry operation and is responsible for ensuring if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry, overseeing entry operations, and for terminating entry as required. For Maintenance work, the Entry Supervisor is the Foreman or Lead Craftsperson. For entries involving operations only (i.e. pit entry for inspection, rounds, etc.) the Entry Supervisor is the Operations Foreman. The entry supervisor reflects the role as defined in the OSHA Confined Space Entry Standard and does not reflect any reference to supervisor in the negotiated contract. Note: The duties of Entry Supervisor may be passed from one individual to another during the course of an entry operation provided it is documented appropriately on the Safe Work Permit.
Hazard	**Hazard means** a physical or hazardous atmosphere. **Reference:** See Hazardous Atmosphere (definition below)

Hazardous Atmosphere	**Hazardous Atmosphere is** an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (i.e., escape unaided from a permit space), injury, or acute illness from one or more of the following causes: a. flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LEL), b. airborne combustible dust at a concentration that meets or exceeds its LEL (Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52 m) or less.), c. atmospheric oxygen concentration below 19.5%or above 23.5% d. atmospheric concentration of any substance for which a permissible exposure limit is published in **Subpart Z, Toxic and Hazardous Substances of 29 CFR 1000** and which could result in employee exposure in excess of the permissible exposure limit (Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, and impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.), and/or e. any other atmospheric condition that is immediately dangerous to life or health (Note: For air contaminants for which OSHA has not determined a permissible exposure limit, other sources of information, such as Safety Data Sheets that comply with the **OSHA Hazard Communication Standard, 29 CFR 1910.1200**, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.).
Host Employer	**Host Employer means** the employer that owns or manages the property where the construction work is taking place.
Hot Work	**Hot Work means** operations capable of providing a source of ignition (e.g., riveting, welding, cutting, burning and heating).
Immediately Dangerous to Life or Health (IDLH)	**Immediately Dangerous to Life or Health (IDLH) is** any condition that: a. poses an immediate or delayed threat to life, a. would cause irreversible adverse health effects, or b. would interfere with an individual's ability to escape unaided from a permit space **Unnoticed Affects:** Some materials, including hydrogen fluoride gas and cadmium fumes (a) may produce immediate transient effects, (b) even if severe, may pass without medical attention, and (c) are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" from the recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.
Inerting	**Inerting means** displacing the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. **Note**: This produces an IDLH oxygen-deficient atmosphere. For specific requirements for entering an inert confined space, refer to RSP-1121-020..

Isolation or Isolate	**Isolation or Isolate is** the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding, misaligning or removing sections of lines, pipes, or ducts, lockout of all sources of energy, or blocking or disconnecting all mechanical linkages. **Reference:** For minimum requirements for isolation, see RSP-1121-010.HSS-008
Limited or Restricted Means for Entry or Exit	**Limited or Restricted Means for Entry or Exit means** a condition that has a potential to impede an employee's movement into or out of a confined space. Such conditions include, but are not limited to, trip hazards, poor illumination, slippery floors, inclining surfaces and ladders.
Line Breaking	**Line Breaking means** the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.
Lockout	**Lockout means** the placement of a lockout device on an energy isolating device, in accordance with RSP-1121-010,HSS-008 ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
Lower Explosive Limit (LEL)	**Lower Explosive Limit (LEL) means** the minimum concentration of a substance in air needed for an ignition source to cause a flame or explosion.
Monitor or Monitoring	**Monitor or Monitoring means** the process used to identify and evaluate the hazards after an Authorized Entrant enters the space. This is a process of checking for changes that is performed in a periodic or continuous manner after the completion of the initial testing or evaluation of that space.
Non-Entry Rescue	**Non-Entry Rescue** occurs when a rescue service, usually the Attendant, retrieves employees in a permit space without entering the permit space.
Non-Permit Confined Space	**Non-Permit Confined Space means** a confined space that meets the definition of a confined space but does not meet the requirements for a permit-required confined space.
Owning Department Representative	Owning Department is an individual designated to prepare and authorize the the Safe Work Permit as specified in this document.
Oxygen Deficient Atmosphere	**Oxygen Deficient Atmosphere** is an atmosphere containing less than 19.5% oxygen by volume.
Oxygen Enriched Atmosphere	**Oxygen Enriched Atmosphere** is an atmosphere containing more than 23.5% oxygen by volume.
Permit Required Confined Space	**Permit Required Confined Space is** a confined space that has one or more of the following characteristics: a. Contains or has a potential to contain a hazardous atmosphere, b. Contains a material that has the potential for engulfing an entrant, c. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section, or d. Contains any other recognized serious safety or health hazard
Permit Required Confined Space Program	**Permit Required Confined Space Program (Permit Space Program) means** the employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

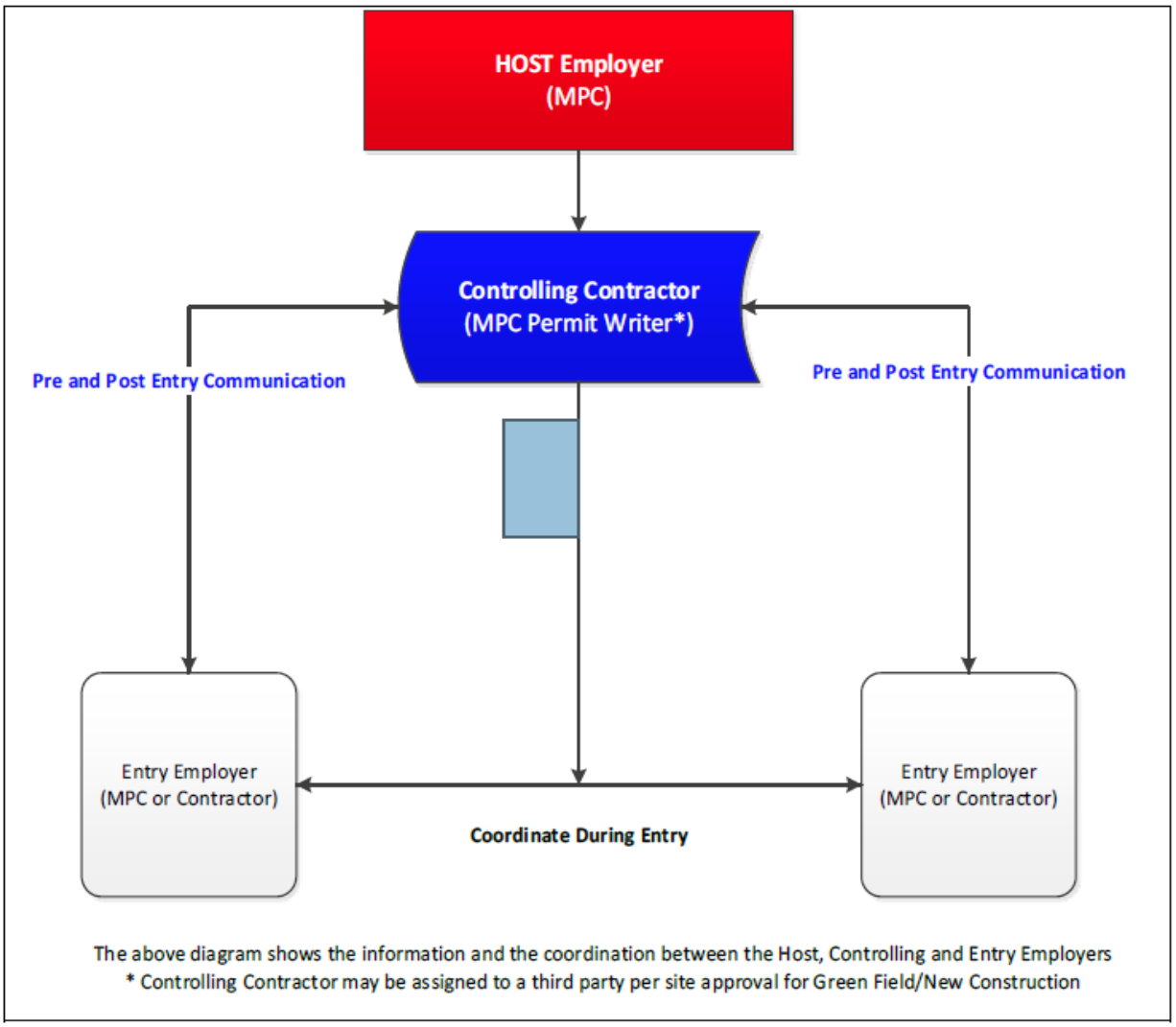
Physical Hazard	**Physical Hazard is** an existing or potential hazard that can cause death or serious physical damage. Examples include, but are not limited to: a. Explosives, b. Mechanical, electrical, hydraulic and pneumatic energy, c. Radiation, d. Temperature extremes, e. Engulfment, f. Noise, or g. Inwardly converging surfaces. Physical hazard also includes chemicals that can cause death or serious physical damage through skin or eye contact (rather than through inhalation).
Prohibited Condition	**Prohibited Condition is** any condition in a permit space that is not allowed by the Safe Work Permit during the period when entry is authorized.
Qualified Person	**Qualified Person is** one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
Representative Permit Space	**Representative Permit Space** is a mock-up of a confined space that has entrance openings that are similar to, and is of similar size, configuration, and accessibility to, the permit space that Authorized Entrants enter.
Rescue	**Rescue means** retrieving, and providing medical assistance to, one or more employees who are in a permit space.
Rescue Service	**Rescue Service is** the personnel designed to rescue employees from permit spaces.
Retrieval Systems	**Retrieval Systems mean** the equipment used for non-entry rescue of persons from permit spaces. This equipment includes a. a retrieval line, b. chest or full-body harness, c. wristlets/anklets, if appropriate, and d. a lifting device or anchor.
Safe Work Permit	**The Safe Work Permit is** a work-authorizing process and record that is managed, prepared and issued by the Refining department that "owns" the equipment or is responsible for the area before certain work is conducted. **Notes:** **(a)** It authorizes a specific scope of work for a specific time frame and is a prerequisite for performing work. **(b)** It is used to assess hazards and to document requirements and conditions such as atmospheric monitoring results, personal protective equipment, confined space details, work requirements (e.g., hot tap, excavation and critical lift), emergency communications, and other potential hazard mitigation means and methods. **(c)** The authorization coordinates and controls the work and is a form of agreement between the Safe Work Permit issuer and all personnel involved with the work.

Serious Physical Damage	**Serious Physical Damage** is an impairment or illness in which a body part is made functionally useless or is considerably reduced in efficiency. Such impairment or illness may be permanent or temporary and includes, but is not limited to: a. loss of consciousness, b. disorientation, or c. other immediate and substantial reduction in mental efficiency. Injuries involving such impairment would usually require treatment by a physician or other licensed health-care professional.
Tagout	**Tagout** is the placement of a tagout device on a circuit or equipment that has been deenergized, in accordance with **RSP-1121-010**,, HSS-008to indicate that the circuit or equipment being controlled may not be operated until the tagout device is removed. The employer ensures that (a) tagout provides equivalent protection to lockout, or (b) lockout is infeasible, and the employer has relieved, disconnected, restrained and otherwise rendered safe stored (residual) energy.
Test or Testing	**Test or Testing is** the process by which the hazards that entrants may encounter in a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.
Vent or Ventilation	**Vent or Ventilation means** controlling a hazardous atmosphere using continuous forced-air mechanical systems that meet the requirements of **OSHA 1926.57-Ventilaiton**.

Appendix B: Host Employer, Controlling Contractor, and Entry Employer Flow Chart

B.1 Flow Chart

The following is the Host Employer, Controlling Contractor and Entry Employer Flow chart.



Appendix C Large, Complex and High-Density Work Confined Space Hazard Assessment Checklist

C.1 Checklist

The following is the Large, Complex and High-Density Work Confined Space Hazard Assessment Checklist:

Large, Complex and High-Density Work Confined Space Hazard Assessment Check List		
Hazard Assessment Conducted On:		
Completed By:		**Date:**
Large, Complex and High-Density Work Confined Space due to one of the following (please check all applicable):		
□	50 or more Entrants into the CSE per shift	
□	Confined Space Entry inside the Confined Space (e.g. Work inside cyclones inside a Regen Vessel)	
□	Complex Scaffold systems which include seal decks that separate the Confined Space	
Hazards		**Hazard Mitigation**
□	Inability to account for Personnel (Entrant) in the event of an Emergency Event	
□	Falling debris and tools and equipment into Entrants work Area	
□	Unable to hear and /or see the alerting system used to notify Entrants of an emergency evacuation	
□	Hot Work or Confined space Inside confined Space not visible to exterior	
□	Fall Hazards inside the space (e.g. aligned internal manways, work inside cyclones, scaffolding construction/anchor points)	
□	Limited egress locations based upon numbers of Entrants	
□	Hazards introduced into the confined space by ventilation systems (combustible Material, High Noise, etc.)	
□	Hole Watch (attendant) is unable to maintain communication with all Entrants	
□	Unable to verify the atmosphere at locations representative of all Entrants	
□	Radiography Impact to the Authorized Entrants	
□		
□		

Appendix D Reclassified Non-Confined Space Notice

D.1 Notice

The following is the Reclassified Non-Confined Space Notice

Reclassification of a Confined Space Notice		
Equipment Name:		
Equipment Number:		
Location:		
Date of Re-classification of PRCS:	**Time Re-classification of Confined Space:**	
Re-classification Team Members:		
Questions	Answers	
Continuous Monitoring **Shall be** required inside this tank		
Continuous Monitoring maybe required in a reclassified excavation based upon the work scope		
For Tanks		
A door sheet (approximately 10’ X 8”) has been cut in the side of the tank		
Tank has been cleaned and is free of all residue material		
Additional Precautions (e.g. PPE, additional continuous monitors, barriers, shields, lighting requirements, rescue equipment, etc.) have been established as needed		
For Excavations		
The excavation has a sufficient protective system (e.g. slopped, benched, or sheeting) and has at least one sloped vehicle ramp (i.e. large enough to support a full-sized truck).		
The excavation is located outside of active/current unit battery limits		
To achieve unrestricted entry or egress the excavation has ladders or ramps every 25 feet long the perimeter of the excavation.		

Note: if the permitted space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated, the PRCS may be reclassified as long as the hazards remain eliminated.
Important: Control of Atmospheric Hazards through forced air ventilation does not constitute elimination of the hazards.

Appendix E Confined Space Entry Reference Sheet Template

E.1 Template

The following is the Confined Space Entry Reference Sheet Template

LAR CONFINED SPACE RESCUE & REFERENCE CARD

CARSON SITE
Call RSS/501 on Radio Channel C-1, Internal Telephone x222 or
(310) 816-8888 in case of an emergency to activate rescue.

EVERYONE HAS THE AUTHORITY AND OBLIGATION TO STOP UNSAFE WORK

RESCUE PLAN #: 2681

SECTION A: GENERAL INFORMATION

Ventilation Plan:	Scope of Work Does Not Require a Ventilation Plan		
Complex & Unit:	FCC / #1 Amine	Type of Space:	Reboiler
Equipment Name:	Amine Reboiler	Equipment #:	RW-2681
Description of equipment location:	East End of Unit.		
Vessel Internals:	Weir	Process:	Hydrogen Sulfide, Lean Amines

Signs and Symptoms of Exposure: In case of accident or if you feel unwell, seek medical advice immediately.
Headache, drowsiness, dizziness, fatigue, irritation to skin.

Describe Scope of Work:
Open, Clean, Inspect & make repairs as needed.

Respirator Recommendation	Additional PPE Recommendation
Pending Atmospheric Reading	

SECTION B: REQUIRED CONTROLS FOR RESCUE PLAN

Equipment Condition: Out of Service

Entry Point: Side Entry

Access Considerations:
Entry point is at ground level.

Rescue Plan Detail Description:
Enter and stabilize patient. Slide or haul patient to entry point. Reboiler is 4'ft off ground.

Special Hazards / Potential Considerations:

Rescue Equipment Required for 1st Response - Rigging Systems:
☑ Rigging Systems-Raise ☑ Rigging Systems-Lower ☑ Rigging System-Change Direction

Rescue Equipment:
☑ PPE: To be determined upon arrival.
☑ Stokes ☑ Miller Board ☑ Half Back
☑ Medical Equipment ☑ Packaging Equipment ☑ Hardware / Rope Bag

SECTION C: APPROVER

Name:	*Robert Hawkinson*	Date Approved:	*March 27, 2022*

Appendix E Confined Space Entry Reference Sheet Template Continued:

LOS ANGELES REFINERY
CONFINED SPACE ATTENDANT
REFERENCE CARD

EVERYONE HAS THE AUTHORITY AND OBLIGATION TO STOP UNSAFE WORK

Signs & Symptoms of Exposure: In case of accident or if you feel unwell, seek medical advice immediately.
Headache, drowsiness, dizziness, fatigue, irritation to skin.

Attendant Duties

- Ensure that a Safe Work Permit has been issued for the confined space.
- Have knowledge of potential confined space hazards, signs and symptoms, and consequences of exposure
- Know products that were last contained in the confined space as defined on the permit.
- Remain outside the confined space at all times during entry and work operations.
- Maintain an accurate count, by name, of all persons working in the space.
- Check the entrants meet the PPE requirements as required by the permit.
- Wear a bright and easily identifiable vest.
- Maintain communication with the entrants and other attendants as applicable.
- Observes activities inside and outside the space to determine if it is safe for entrants to remain in the space.
- Be equipped with a radio or other means to provide immediate communication to summon rescue and other emergency services when entrants need assistance.
- At no time shall an attendant attempt rescue by entering a confined space. An attendant may perform non-entry rescue utilizing an in-place retrieval system.
- Do not allow unauthorized persons to enter the confined space. And notify entry supervisor if unauthorized person(s) enter the space.
- Understand the use and operation of instrumentation provided to conduct atmospheric monitoring and retrieval systems.
- Properly conduct continuous monitoring to ensure the sample is representative of the entrant's location.
- Contact the permit writer for an atmospheric test when the confined space has been vacated for more than two hours.
- Prevent the fouling of hoses, cords, and lifelines. Lifelines must be properly secured to anchor point and retrieval systems, when available.
- Attendants can serve as fire watches for hot work inside the confined space or hand/lower work materials to entrants at the permit writer's discretion; but not perform duties which interfere with their Attendant duties.
- Orders entrants to evacuate the space immediately when required.
- Places barrier/sign over opening when no entrant is in space.

Evacuation is necessary if:

Order entrant to evacuate the space *immediately* and notify Permit Writer and the Entry Supervisor when:

- A situation is observed which the permit does *not* allow.
- A behavioral consequence due to hazard exposure is detected.
- A situation is observed outside the space which could endanger the entrant.
- An uncontrolled hazard is detected within the space.
- Attendant must leave the monitoring location or is unable to perform required duties.
- The plant alarm system is activated.
- The time limitation on the permit or atmospheric testing has expired.

Appendix F. Contaminant Thresholds and Conditions

The following is the Contaminant Threshold and Conditions Table:

F.1 Table

Contaminant	PEL/TLV (ppm)	STEL (ppm)	IDLH (ppm)	Odor Threshold (ppm)
Oxygen	19.5-23.5%	N/A	N/A	N/A
Lower Explosive Limit (LEL)	0% Hot Work 0-10% Cold Work	N/A	N/A	N/A
Carbon Monoxide	25	N/A	1200	Odorless
Hydrogen Sulfide (H2S)	10	15	100 (MPC)	0.001-0.13
Sulfur Dioxide (SO2)	0.5	1	100	0.33-5

Revision History

Document Revision History

Complete the following table for each document revision.

Rev. No.	Description of Change	Author	Approved By	Rev. Date	Effective Date
0	Integrated HSS for MPC LAR Hot Work Safety	Johnny Maldonado	Integrated HSS for MPC LAR Hot Work Safety		
1	Added language about entry during pigging.	Connie Lema	Added language about entry during pigging.	10/6/23	10/6/23