

BP OIL -- TOLEDO REFINERY

	Toledo Refinery	Procedure No.: SAF 032
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SCOPE	This procedure describes how confined space entry will be managed at BP Toledo Refinery. It applies to BP employees and contractors, who may enter a confined space simultaneously.
HEALTH Special PPE & Special Hazards	<p>Possibility of personnel being subjected to oxygen deficiency, flammable gases and vapors, toxic materials, or radiation hazards inside the confined space.</p> <p>Mechanical or electrical hazards within the confined space.</p> <p>Having an emergency occur outside the confined space which would affect the safety of those inside.</p>
SAFETY	Protection of personnel working or entering Confined Space.
REFERENCE DOCUMENTS	<ul style="list-style-type: none"> • 29 CFR 1910.146 • 29 CFR 1926.651 • PSME 18 Safe Use of Nitrogen • Toledo Control of Work Policy • Toledo Isolations Policy • SAF-044 Hot Work, Hot Work Spark Potential, and Vehicle Entry
SPECIAL MATERIALS & EQUIPMENT	Communication Equipment Rescue Equipment
QUALITY	N/A
ENVIRONMENTAL	N/A

Definitions

After-hours

- Work performed outside of the regular business hours of Monday – Friday, 7:30 AM – 4:00 PM. Holidays are also considered after-hours work.

Area Authority

- This is the operations person who manages the day-to-day CoW in each operating area.

Attendant(s)/Standby Person(s)

- A person who is authorized by the issuing or performing authority to remain outside the confined space to monitor the authorized entrants and conditions throughout the confined space entry period and has specific duties defined in this procedure. (Must be knowledgeable in Confined Space Hazards.)

Authorized Entrant

- A person who is authorized by the performing authority (or issuing authority if also acting as the performing authority) to enter the confined space. (Must be knowledgeable in Confined Space Hazards.)

Authorized Gas Tester (AGT) Level 1

- An individual authorized and competent to conduct gas testing and interpret the results for confined space entry. An AGT Level 1 is also qualified as an AGT Level 2 and 3.

Authorized Gas Tester (AGT) Level 2

- An individual authorized and competent to conduct gas testing and interpret the results for all levels of gas testing EXCEPT confined space entry. An AGT Level 2 is also qualified as an AGT Level 3.

Authorized Gas Tester (AGT) Level 3

- An individual who has received practical instruction on the use and interpretation of the results from both portable and personal gas monitors. Authorized only for ongoing continuous gas testing.

Confined Space

- Any space large enough and so configured that an employee can enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy. Examples include:
 - process vessels and related equipment (vessel tower skirts, flare stacks, and boilers), storage tanks
 - vaults and other underground spaces with limited ventilation, sewers, pits, pipe trenches
 - entry onto an external floating roof tank

- unventilated temporary shelters with the potential to trap hazardous vapors/gases or which can become oxygen deficient as a result of work within them using nitrogen or inert welding gas
- any temporary cut, trench, excavation or depression that exceeds 4 feet in depth.
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NOTE: Temporary shelters where the walls/sheets do not go all the way to the ground have some natural ventilation, and therefore are not considered confined spaces.

Confined Space Entry

- Occurs when any part of a person's body breaks the plane of an opening into the confined space.

Confined Space Entry Permit Book

- A book containing a four (4) page permit pink, manila, green and yellow. Pink remains in book, green posted in Control Room, yellow is a copy for contractors and manila is attached to Confined Space.

Confined Space Entry Permit Form

- A documentary control device to ensure that confined space entry is authorized and executed subject to specified safety precautions. The actual work to be carried out in the confined space, be it hot work or cold work, shall be carried out under an accompanying WCC and Permit.

Confined Space program

- The overall program for controlling confined space entry, for protecting employees from confined space hazards, and for regulating employee entry into confined spaces.

Engulfment

- The surrounding and effective capture of a person by a liquid or a 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 or crushing.

Hazardous Atmosphere

- An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:
 - a) flammable gas, vapor, or mist that exceeds 10% LFL (Lower Flammable Limit)
 - b) Airborne combustible dust that meets or exceeds its LFL
 - c) Atmospheric oxygen concentration below 19.5% or above 23.5%
 - d) Atmospheric concentration of any substance for which a dose or PEL is published in OSHA 1910 (Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances) and which could result in employee exposure in excess of its dose or PEL.
 - e) Any other atmospheric condition that is immediately dangerous to life and health.

Immediately Dangerous to Life or Health (IDLH)

- Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Inerting

- The displacement of the atmosphere in a permit space by a noncombustible gas (nitrogen) to such an extent that the resulting atmosphere is noncombustible. This produces an IDLH atmosphere.

Inert Entry

- Entry into a confined space that contains a potentially lethal atmosphere, such as IDLH or inert atmosphere.

Isolation

- Positive isolation shall be used for confined space entry.
- A permit space that has been removed from service and completely protected against the release of energy and material into the space by such means as:
 - a) Blanking or blinding
 - b) Misaligning or removing sections of lines, pipes, or ducts
 - c) Lock out or Tag out of all sources of energy
 - d) Blocking or disconnecting all mechanical linkage

Issuing Authority / Operations Authority

- An employee designated by local management who has authority to prepare, authorize, and revoke the confined space entry permit. An employee authorized in Control of Work to issue daily work permits.

Labeling of Confined Space

- Each confined space that will be entered shall bear a warning sign at each entrance warning people of the location and danger posed by confined spaces (such as "Danger – Confined Space – Entry By Permit Only").

Oxygen-deficient atmosphere

- Any area where oxygen concentrations are below 19.5%

Performing Authority - (Entry Supervisor)

- A designated supervisor appointed by local management to accept the confined space entry permit and subsequently be in charge of the confined space entry work. This person is responsible for determining if acceptable entry conditions as defined in the risk assessment and WCC-Permit are present at the space, for verifying that all tests specified by the WCC-Permit have been conducted, and for terminating entry as required. The performing authority is the maintenance supervisor, project lead, or contracted personnel filling these identified roles acting on behalf of BP. In addition, the asset shift supervisor may act as the performing

authority when only operations staff will be involved in the confined space entry (e.g. monthly gauging of floating roof storage tanks).

NOTE: If the asset shift supervisor signs as the performing authority and later entry will be performed by non operations personel, a new confined space entry permit will be required prior to non operations staff entering the space. The new permit will be signed by a maintenance or project performing authority as the asset shift supervisor does not act as the confined space entry supervisor for non-operations personnel.

Permit-required Confined Space. 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.
- d) Contains any other recognized serious safety or health hazard.
- e) Excavations greater than 4 feet in depth.

Positive Isolation

- Spool removal - removal of a pipework section or spool piece and blinding the live end.
- Blank isolation - insertion between flanges of a blank (spade), the swinging of a spectacle blank (figure-8) or replacement of a spacer (slip-ring) with a line blank (spade).

Reclassified Confined Space

- A confined space that does not contain or have the potential to contain any hazard capable of causing death or serious harm. A permit required space that:
 - a) Confined space isolation has been achieved.
 - b) Poses no actual or potential atmospheric hazard, i.e., oxygen deficiency, flammable gases, vapors, and toxic materials.
 - c) All non-atmospheric hazards have been eliminated.
 - d) Does not need names of entrants or attendants on permit. (No attendant needed)
 - e) Entrants are not required to wear a harness or lifeline and a confined space rescue team is not required to be on-site for a Reclassified Confined Space entry.

Nitrogen Restricted Area

- Any area around a vessel where oxygen concentration may be less than 19.5% by volume. These areas may exist around equipment where nitrogen is being used to purge the vessel, work around equipment when nitrogen is being used for leak testing, work inside process analyzer buildings with nitrogen purging facilities, work near equipment that is nitrogen blanketed, and work in temporary enclosures where nitrogen is being used for specialty welding activities.

Temporary Shelter

- A temporary shelter is not considered a confined space as long as it was designed and constructed for employee occupancy, does not have limited means for entry and exit, and has sufficient ventilation to keep atmospheric gas levels within acceptable ranges .
- Temporary shelters may include asbestos remediation enclosures, enclosures for welding, or shelters erected for wind breaks, provided they have a door cut into them and the walls do not go all the way to the ground to provide ventilation.
- There are separate rules regarding the placement of temporary shelters which can be found in the following procedures: (a) BP Engineering Technical Practice RM-GP 04-30 Guidance on

Practice for Design and Location of Occupied Portable Buildings within Refineries and Chemical Plants or (b) Toledo Business Unit Occupied Portable Buildings and Shelters.

NOTE: If temporary shelters are not considered confined spaces, they need to be constructed in a manner that it will remain contaminate free due to natural ventilation and evaluated to ensure they do not have the possibility to become a hazardous environment.

- 1.0 **Responsibility**
- 1.1 Where confined space entry is involved, the Performing Authority will approve a confined space entry permit. He/She may delegate authority to a qualified person to prepare the confined space entry permit when, in his judgment, these assignments can be safely made. The Performing Authority, Area Authority and Issuing Authority are responsible for making sure all precautions required on the WCC-Permit have been taken to provide and maintain a safe environment for confined space entry. The Performing Authority approves the permit after all precautions have been taken. When confined space entry permit is issued, copies will be located in the control center and at the confined space entry. The relief supervisor will assume responsibility where work extends through a shift change.
- 1.2 The Performing Authority and Area Authority perform a risk assessment to determine safety requirements and protective equipment necessary for keeping personnel safety. The Performing Authority communicates the requirements to the work crew. The Performing Authority will also direct initial work or confined space entry activities, make periodic checks at the work site, and check with the operators to ensure the safety of all entrants and attendants.
- 1.3 The employers of the entrants, attendants, and authorized gas testing person are responsible for providing all equipment necessary to safely enter a confined space at no cost to the employee, including testing equipment, ventilating equipment, communications equipment, PPE, lighting, barriers, equipment for ingress and egress, and rescue equipment (except if it is provided by rescue services).
- 2.0 **Required Risk Assessments and documentation**
- 2.1 Every confined space entry shall have a Level 2 Risk Assessment to establish whether the proposed confined space entry can be performed safely. The Level 2 Risk Assessment shall consider the items listed in Appendix S of the RDP for COW. The Level 2 Risk Assessment should identify types of atmospheric testing to be performed.
- 2.2 A "Danger - Confined Space Entry" sign shall be positioned across every entryway as soon as it is opened.
- 2.3 Gas testing results shall be recorded on the Confined Space Permit or on a Gas Testing Sheet located with the Confined Space Permit. Testing information shall be recorded, including the date, time, results of the test, and initials of the Authorized Gas Tester (AGT) Level 1.

3.0 **Isolation Requirements**

- 3.1 Harmful materials may be released at the work sites of confined spaces that have connections with equipment in service or under static pressure. Confined spaces in which work is to be done must be isolated from all sources.
- 3.2 All confined space entries shall have isolation of all hazardous energy sources.
- 3.3 Positive isolation shall be used for all confined space entries. Exceptions include:
 - a. In the case of inert entries, if the only line that is not positively isolated is the Nitrogen line.
 - b. If level gauges/site glasses are not blinded, then they shall be treated as part of the vessel and as such will be washed/cleaned and gas freed.
 - c. Allowing for removal of material used for washing or cleaning the space. However, any bottom drains or bleeds that lead or are connected to the sewer must be protected against vapors traveling through the drain and into the space by covering or isolating the sewer.

NOTE: Positive isolation can **not** be replaced with valved isolation even if the time to install the blank is greater than the time it takes to perform the work.

- 3.4 If positive isolation can not be achieved, then the isolation shall be approved by the Operations Manager and documented on the Isolations Approval Form and Level 2 Risk Assessment. See the Task Risk Category Table for other required approvers.
- 3.5 Positive isolation shall be made at the closest point to the vessel.
- 3.6 Where positive isolation can not be made at the closest point to the vessel due to access or operational reasons, then the isolation point shall be approved as defined in the Toledo Isolation Policy.
- 3.7 All isolation points shall be documented on an approved Isolation Plan. Isolation Plans list the location of blanks/blinds and other isolation points in accordance with SAF-037 Control of Hazardous Energy (lockout/tagout) and SAF-102 Developing Isolation Plans.
- 3.8 Refer to MAINT-030 Use of Pressure Rated Line Blanks for information on determining proper selection of pressure rated blanks.
- 3.9 Any mechanical equipment, such as internal moving devices, exposed electrical conductors, electrical grids in desalters, electrodes in precipitators, associated with the confined space shall be de-energized and isolated according to SAF-037 Control of Hazardous Energy (Lockout/tagout) and documented on the Isolation Plan.
- 3.10 Any radioactive devices associated with the confined space shall be de-energized and isolated, locked out, and tagged out according to SAF-067 Radiation Safety Program and Procedure and SAF-037 Control of

Hazardous Energy (Lockout/tagout) and documented on the Isolation Plan.

- 3.11 Block off and divert the flow of harmful materials: ventilate or inert the atmosphere in sewers, catch basins, water conduits, wells, and sumps as necessary.
- 3.12 If isolation is not possible because the space is part of a continuous system (such as a sewer), work around, on, or in the adjacent items must be controlled or halted so that no harmful effect could occur in the item being entered. Pre-entry testing and continuous monitoring shall be conducted to ensure the atmosphere remains non-hazardous in those areas where the entrants are working.
- 3.13 Elevator repairs require confined space entry into the spaces below and above the cars for troubleshooting problems. The specialty contractors used for elevator repairs shall be trained in lockout/tagout procedures and may be made responsible for the isolation of the energy sources of the elevators before and during entry. All other requirements of this procedure still apply.

4.0 Authorized Gas Testers

- 4.1 Authorized Gas Tester (AGT) Level 1 shall conduct gas testing for confined space entry.
- 4.2 The AGT Level 1 can not be the Performing Authority or the Issuing Authority for the space to be entered. The AGT Level 1 cannot be the Shift Supervisor who signed the Confined Space Permit.
- 4.3 Authorized gas testers shall be trained and competency assessed in accordance with the requirements of BP Refining Defined Practice for Control of Work, sections 2.14-2.16 and Appendix R.
- 4.4 The AGT Level 1 shall be **trained** and **competent** to:
 - a. Test for the presence of flammable vapors, toxic gases, and oxygen.
 - b. Correctly interpret the results of gas tests ensuring the correct use of portable and fixed gas detectors.
 - c. Sign the Confined Space Entry Supplementary Certificate and identify any special precautions required.
- 4.5 The AGT Level 1 shall be **accountable** for:
 - a. Providing input for Level 2 Risk Assessments and Permit development.
 - b. Carrying out a job site visit, identification of hazards, and job site gas tests prior to issue of the Confined Space Permit.
 - c. Documenting tests on the Confined Space Permit and/or gas testing sheet.
 - d. Conducting retesting.
- 4.6 AGT Level 3 shall carry out continuous monitoring within the confined space while there are entrants. The AGT Level 3 can be a member of the work crew inside the space wearing a personal gas monitor. AGT Levels 1 and 2 are qualified as an AGT Level 3.

- 4.7 The AGT Level 3 shall be **accountable** for:
 - a. Monitoring for the presence of flammable vapors
 - b. Operating portable or personal gas detectors
 - c. Responding to the alarms of portable, personal, and fixed gas detectors.

5.0 **Purging and Testing Atmosphere**

- 5.1 All testing shall be done with a calibrated, direct-reading instrument.
- 5.2 Testing shall be completed by an Authorized Gas Tester (AGT) Level 1.
- 5.3 Gas testing of a confined space shall be carried out before it is certified as safe to enter. Tests shall check for the adequacy of the oxygen level and also the presence of all types of gas or toxic vapor which could be present. An acceptable gas test result shall be obtained and recorded before the Confined Space Permit is authorized.
- 5.4 The atmosphere shall be tested by an AGT Level 1 at necessary locations for oxygen, flammable, explosive, and toxic contaminant that may be present. Specific types of gas testing required shall be identified during the Level 2 Risk Assessment.
- 5.5 At a minimum, testing shall be performed at every entry way into the confined space and should be performed at locations within the space where entrants will be located. The testing order is: oxygen, then combustible gases and vapors, then toxic gases and vapors. If the gas testing equipment performs tests at the same time, the AGT Level 1 must look at the oxygen reading first, and ignore all other readings if oxygen is below the acceptable range.

NOTE: Oxygen must be tested first because some gas testing equipment does not work in low oxygen environments.

- 5.6 After isolating enclosed equipment for interior work, purge it free of unsafe concentrations of flammable, explosive, or toxic materials. Use purge medium suitable for the confined space and its content. After purging, test the atmosphere thoroughly to determine effectiveness of purging; re-purge and retest as necessary.
- 5.7 If the Authorized Gas Tester is required to enter an unknown atmosphere to take tests, that person will wear a supplied air respirator (SCBA or airline with egress cylinder), body harness, and retrieval line with an outside attendant.
- 5.8 Each entrant or authorized representative must be provided the opportunity to observe any testing of the space that is conducted prior to initial entry or subsequent to such entry.
- 5.9 The AGT Level 1 shall repeat the gas test every 12 hours, or at a greater frequency if defined in the risk assessment. See section 4.0 for information on AGTs. The AGT Level 1 shall also repeat gas test results upon request.

- 5.10 Testing for oxygen, flammables (LEL), explosives, H₂S and CO will be done at least every 12 hours during entry. Testing for other toxic contaminants will continue until all contaminants have been removed from the space.
- 5.11 Test results must be written on the permit or an attached gas testing sheet at the confined space entry.
- 5.12 For initial testing before a Confined Space Permit is issued, air moving equipment shall be shut off for a minimum of 30 minutes before making atmospheric tests. If tests show unsafe levels with ventilation stopped, controls shall be implemented to protect authorized entrants from the hazardous atmosphere before any entry takes place.
- 5.13 Repeat testing at the 12 hour intervals shall be taken with all air moving equipment shut off for a minimum of 15 minutes.
- 5.14 The air supply for forced air ventilation shall be from a clean source that will not increase the hazards in the space. The forced air ventilation shall be directed so it ventilates the immediate area where the personnel will be working and must continue until all entrants have left the space.
- 5.15 If a hazardous atmosphere is detected during entry when using forced air ventilation, each entrant shall leave the space immediately, the space shall be evaluated to determine how the hazardous atmosphere developed, and measures shall be taken to protect employees from the hazardous atmosphere prior to entry.

6.0 **Work Requirements
for Permit Required
Confined Space.**

- 6.1 An attendant is required for all entry into permit required confined spaces.
- 6.2 Continuous monitoring is required for all confined space entry. Minimum requirement for continuous gas monitor is a 4-gas tester (oxygen, LEL, H₂S, CO)
- 6.3 Any Hot Work or Hot Work Spark Potential to be completed inside the space must meet the requirements of SAF 044 Hot Work and Hot Work Spark Potential Procedure.
- 6.4 Entry **without respiratory protection will be allowed only after:**
 - a. Deposits, scales and sludgs likely to give off vapors harmful to someone's health have been removed.
 - b. The work to be done inside the confined space will not involve the release or generation of flammable or toxic gases, vapors, fumes, mist or dust.
 - c. The confined space is adequately ventilated and tested to ensure the removal of toxic, asphyxiating and flammable material and:
 - Oxygen content is between 19.5% and 23.5%.

- Flammability shall not exceed 0% of the LEL as measured by a combustible gas meter.
 - Toxic contaminants shall not exceed the published PEL, TLV or other recommended limit.
- d. PELs have been established for many toxins. Some examples include: H₂S, benzene, ammonia, hydrocarbons and carbon monoxide. Consult with or reference process stream lists found on the HSE webpage, MSDSs or the Little Chemical Book.
- e. Proper ventilation as defined in the risk assessment must be maintained when persons are in the confined space.

6.5 **Entry with respiratory protection when:**

- a. PELs are exceeded.
- b. If confined space testing indicates that respiratory protection is required, it must be documented on the risk assessment.
- c. Entry cannot be made into any confined spaces if there is more than 10% of the LEL of gas, vapor, mist, or dust in the air unless atmospheres have been made noncombustible by displacing the air with an inert gas such as nitrogen.

7.0 Requirement for entry into vessels with an oxygen-deficient atmosphere or Inert Entry

- 7.1 Working inside a vessel that contains an oxygen-deficient atmosphere is considered Immediately Dangerous to Life and Health (IDLH). Reasonable alternatives to this option must be discussed before this option is selected. The alternatives and discussion must be documented before any work can proceed.
- 7.2 Entries into an oxygen-deficient vessel, including inert entries, shall only be carried out by a specialty contractor with the expertise in carrying out this type of work. Examples of oxygen-deficient entry situations may be spaces which contain, or have contained, fresh or spent catalyst and are yet uncleaned.
- 7.3 A BP employee will be designated as responsible for the assurance of the safe execution of activities by BP and contractor personnel working in or around potentially oxygen deficient atmospheres. The use of a specialty contractor to carry out work does not absolve the local site management from its responsibility in ensuring that such work can be carried out safely.
- 7.4 Inert entries shall meet all the requirements in this procedure, except those specific requirements that differ in this section.
- 7.5 The specialist contractor for inert entries shall provide BP with suitable evidence of their competence and expertise.
- 7.6 All inert entries require a Level 2 Risk Assessment and approval by the

Senior Operations Manager. The Level 2 should include a representative from the specialist contractor. The Level 2 should include emergency response and rescue plan and communication requirements. The Checklist of Minimum Requirements for Inert Entry must be completed before entry, and should be done during the Level 2 Risk Assessment

- 7.7 Procedures shall be written to define how a vessel or other piece of equipment will be taken out of service. Procedures shall be written for vessel entry, including items such as how vessel will be accessed by personnel, work scope and how to return it to service. The designated BP responsible employee will review and sign off on the vessel entry procedures. Additional points to include are:
- a. Assurance (e.g. testing, analysis, QA/QC) of the quality and reliability of the nitrogen source.
 - b. An Isolation Plan or diagram of the vessel with isolation points, nitrogen purging inlets, vents, and outlets, entry points, internal fittings.
 - c. Methods to verify nitrogen flow, control, volume and venting.
 - d. Methods to control personnel access to the equipment and the nitrogen restricted area.
 - e. Steps to eliminate or minimize other activities not associated with the use of nitrogen but are near the nitrogen restricted area.
 - f. Ways to manage other risks unique to the activities (e.g., skin absorption of contaminants in the equipment).
 - g. Provisions to vent nitrogen from equipment to a location where the nitrogen does not create a hazard to unprotected personnel.
- 7.8 The initial, periodic, and continuous atmospheric testing shall be completed by the specialty contractor.
- 7.9 The Shift Supervisor, in consultation with the HSSE group, shall verify the atmospheric test readings are within the prescribed limits. The Shift Supervisor may delegate the task of verifying the atmospheric test readings being recorded by the contractor to an Issuing Authority or AGT Level 1.
- 7.10 For inert entries, oxygen levels shall be maintained below 5% to eliminate the potential for fire or explosion inside the confined space. Also, the vapor concentration of flammable substances in air shall be maintained below 10% LEL to eliminate the fire and explosion hazard where the purge gas exits the confined space and mixes with air.
- 7.11 A nitrogen restricted area shall be established around vessels with an oxygen deficient atmosphere.
- 7.12 Atmospheric (gas) testing shall be performed to identify the parameters of the nitrogen restricted area. Two trained and competent people from the specialty contractor group shall conduct this testing. One will reside at a safe distance to perform rescue if needed. Both individuals shall wear positive pressure, continuous flow, full face supplied breathing air and rescue equipment (body harness).

CAUTION

Proper gas testing equipment must be used which will accurately measure oxygen and combustibles in a potentially oxygen-deficient atmosphere. Refer to SAF-023 Using Direct Reading Gas Testing Equipment for additional guidance and explanation.

7.13 Once the nitrogen restricted area is determined, it will be cordoned off using barricade tape and warning signs placed at all access points, including stairs, ladders, etc. The Shift Supervisor shall ensure that the area around the inert confined space is barriered off. Warning signs should alert personnel that the atmosphere may be oxygen deficient.

7.14 For Nitrogen inert atmospheres, the following verbiage will be used around the nitrogen restricted area:

**Danger – Nitrogen in Use
Life Threatening Hazard Present
Oxygen-Deficient Hazard – Supplied Air Required
Authorized and Trained Personnel Only**

7.15 The specialist contractor shall manage entry into the nitrogen restricted area. Only people wearing breathing apparatus shall be allowed access inside the barriers.

7.16 The specialist contractor shall supply the rescue resources and rescue team. Rescue personnel and equipment must be assembled and ready for immediate response at the vessel. They shall provide an emergency response rescue plan in accordance with section 13.0 Duties of rescue team.

7.17 Refer to PSME 18 Use of Nitrogen and SAF-086 Use of Nitrogen for further requirements for inert entry.

8.0 Confined Space Entry Permits

8.1 All testing shall be done with a calibrated, direct-reading instrument.

8.2 The confined space entry permit must be completed and signed by the Performing Authority, Operations Authority (Shift Supervisor) and Operator (Issuing Authority) before entry into the space is authorized.

8.3 Confined space entry permits are valid until their expiration date as long as conditions in the space do not change.

8.4 A confined space permit may be issued for up to 30 days. For confined space work that takes longer than 30 days, a new permit must be issued at least every 30 days.

8.5 Permits are considered cancelled when entry operations have been completed and the space is closed up. If the space is re-opened, a new permit must be written.

- 8.6 The completed permit shall be made available to all authorized entrants by posting it at the confined space. If the copy posted at the confined space becomes illegible, a new permit must be written.
- 8.7 The performing authority terminates entry and cancels the entry permit when the entry operations covered by the permit have been completed or a condition that is not allowed under the entry permit arises in or near the permitted confined space.
- 8.8 Any problems encountered during entry operations shall be noted on the permit so they can be reviewed during the annual review as described in section 16.0.
- 8.9 A roster or attendance sheet may be used to keep track of authorized entrants into the permit space. The roster allows attendants to quickly and accurately determine who is inside the space. The copy of the roster must be kept at the space with the permit.
- 8.10 The confined space permit must describe the communication procedures used by authorized entrants and attendants to maintain contact during entry (can be entered on "communication" line of permit).

9.0 **Reclassified
Confined Spaces**

A space classified as a permit-required confined space may be changed to a reclassified confined space under the following procedures:

- 9.1 If the permit space poses no actual or potential atmospheric and physical hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be changed to a reclassified confined space for as long as the atmospheric hazards remain eliminated.
- 9.2 An Authorized Gas Tester Level 1 shall conduct and document gas testing at least every 12 hours. Test results can be included as an attachment to the confined space permit.

NOTE: Isolation of space shall be as in Section 3.0, Isolation Requirements.

- 9.3 If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed under the purging and testing section of this procedure. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be changed to a re-classified confined space for as long as the hazards remain eliminated.

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

- 9.4 Operations shall document the basis for determining that all hazards in

a permit space have been **eliminated**, through a certification that contains the date, the location of the space, test results, and the signature of the person(s) making the determination. This certification shall be reviewed by the Area Authority, Maintenance and a member of the Safety Group before reclassification is complete. The certification shall be made available to each authorized entrant entering the space. The confined space entry permit form shall be used for this certification.

- 9.5 A new confined space entry permit form will be used with the reclassified confined space block checked.
- 9.6 Names of attendants and entrants will not be required on the permit and no attendant will be needed at the confined space.
- 9.7 Danger signs must be posted at the space entrance(s).
- 9.8 If any hazards arise or are introduced (i.e., Hot work, flammable or toxic substances, etc.) within a permit space that has been reclassified, each employee in the space shall exit the space. Operations shall then re-evaluate the space and determine whether it must be classified as a permit required space, in accordance with the applicable provisions of this procedure.
- 9.9 Entrants are not required to wear a harness or lifeline and a confined space rescue team is not required to be on-site during Reclassified Confined Space entry. If rescue is necessary, it can be performed by the emergency response team or local fire and rescue in reclassified confined spaces.

10.0 Duties of Performing Authority (entry supervisor)

- 10.1 Ensures that all precautionary measures stipulated on the confined space entry permit form and accompanying documentation are followed.
- 10.2 Verify gas testing required by the WCC-Permit has been completed. Verify results of gas testing are within acceptable ranges, such as the limits in the Little Chemical Book.
- 10.3 Notify confined space rescue team representative prior to entry into the space so the confined space can be evaluated and a rescue plan developed.
- 10.4 Verifies that rescue services are available and the method for contacting them is working. This may include contacting an outside firm for after-hours coverage.
- 10.5 Evaluate need for non-entry rescue. If non-entry rescue is not used, document reasons on the confined space permit.
- 10.6 Informs contractors of the requirements of this procedure (see section 14.0).
- 10.7 Coordinates entry operations when employees of more than one employer are working simultaneously as entrants in a permit space so

that employees of one employer do not endanger the employees of any other employer.

- 10.8 Know the hazards which may be faced during entry.
- 10.9 Recognize the signs and symptoms of exposure to a hazard. (MSDS).
- 10.10 Understand the consequences of exposure to a hazard and is aware of behavioral effects of hazard exposure in entrants. (MSDS).
- 10.11 Verifies that all tests specified have been conducted and that all procedures and equipment specified are in place before signing the permit to allow entry to begin.
- 10.12 Terminates and cancels the entry permit when the entry operations covered by the permit have been completed or a condition that is not allowed under the entry permit arises in or near the permitted confined space.
- 10.13 Removes unauthorized individuals who enter or attempt to enter the space.

**11.0 Duties of
Authorized Entrants**

- 11.1 All entrants are required to wear a harness when entering a permit required confined space unless deemed to pose more of a hazard to the entrant or it would not aid in rescue (lanyard or lifeline is only needed when it does not pose entanglement hazard). This exemption requires the deliberation of the Issuing Authority, the Performing Authority, and a member of the safety group.
- 11.2 Communicate with attendant as necessary to enable the attendant to monitor entrant status.
- 11.3 Know the hazards which may be faced during entry.
- 11.4 Recognize the signs and symptoms of exposure to a hazard. (MSDS).
- 11.5 Understand the consequences of exposure to a hazard and is aware of behavioral effects of hazard exposure in entrants. (MSDS).
- 11.6 Notify the attendant when:
 - a) the entrants self-initiate evacuation of a confined space.
 - b) the entrant detects a prohibited condition.
 - c) the entrant recognizes any warning sign or symptom of exposure to a dangerous condition.
- 11.7 Be aware of and properly use personal protective equipment required, such as retrieval lines, respirators, or clothing needed for safe entry and exit.
- 11.8 Exit permit space when: attendant orders evacuation, an evacuation alarm is activated, or entrant perceives endangerment or prohibited condition.

- 11.9 Ensure isolation is complete and install personal lock if necessary (See SAF-037 Control of Hazardous Energy (Lockout –tagout)). Personal locks are not required for those confined space entries where lockout is not possible, for example a trench.
- 11.10 Make sure rescue plan has been developed and is posted at the confined space along with emergency notification plan.

**12.0 Duties of
Attendant(s)/Standby
Person(s)**

- 12.1 Know hazards which may be faced during entry.
- 12.2 Recognize the signs and symptoms of exposure to a hazard. (MSDS).
- 12.3 Understand the consequences of exposure to a hazard and is aware of behavioral effects of hazard exposure in entrants. (MSDS).
- 12.4 An attendant is stationed and remains outside confined space at all times during entry operations.
- 12.5 Does not perform duties that might interfere with the attendants primary duty to monitor and protect entrants.
- 12.6 Maintains an accurate count and list of all persons in the confined space.
- 12.7 Monitors activities inside and outside the entry space to determine if it is safe for entrants to remain in the confined space, and notifies process operator (via radio, messenger, call box, etc.) if conditions change.
- 12.8 Communicate with authorized entrants (i.e., visual, voice, radio, etc.), as necessary to monitor their status.
- 12.9 Monitors one or more spaces as long as he/she is in close proximity and can monitor the entrants and their activities in the space and all who enter and leave each space. If monitoring more than one space and an emergency occurs in one of the spaces, the attendant must notify entrants in the other spaces to evacuate the spaces until the attendant is no longer focused on the space with the emergency.
- 12.10 Summons help or emergency services as soon as he/she determines that entrants need to escape from confined space entry hazard.
- 12.11 Orders entrants to evacuate space when:
 - a) Observing a condition which is not allowed on confined space entry permit.
 - b) Detecting behavioral effects of hazard exposure.
 - c) Detecting a situation outside the space which could endanger entrants.
 - d) Detecting an uncontrolled hazard within space.
 - e) Monitoring confined space entry in more than one space and must focus attention on the rescue of entrants from one of those spaces.
 - f) Leaving the work station, unless another qualified attendant is substituted.

- g) The attendant cannot effectively and safely perform all the duties described in this section.

- 12.12 Warns unauthorized people (i.e., persons not listed on permit) away from confined space entry.
- 12.13 Requests unauthorized person to exit immediately if they have entered confined space.
- 12.14 Informs the authorized entrants if an unauthorized person has entered the confined space.
- 12.15 When entrants as a group are leaving or re-entering a confined space, the attendant shall notify appropriate operating personnel (i.e., brakes, lunch, etc.)
- 12.16 **May not enter** the confined space to attempt the rescue of entrants. They may perform non-entry rescue as specified in the rescue plan.

13.0 Duties of rescue team

- 13.1 Evaluate confined spaces and develop written rescue plan.
- 13.2 Deliver the written rescue plan to the performing authority or operator issuing the confined space permit.
- 13.3 Put a copy of the rescue plan in the Emergency Operations Center (EOC).
- 13.4 For all active permit spaces, the team leader or designee must confirm conditions have not changed and the rescue plan is still valid and sign the rescue plan at least once every 24 hours.
- 13.5 If other confined space work must stop because the team was activated, a member of the rescue team must notify all attendants that confined space work must stop immediately.
- 13.6 Conduct training and drilling as required.
- 13.7 Perform a risk assessment of the permit required confined space prior to entry for rescue. This risk assessment replaces the need to sign into the existing safe work permit.
- 13.8 If responding to an entrant who has been exposed to a substance for which a MSDS is available, ensure that the MSDS is made available to the medical team treating the entrant.

**14.0 Outside personnel
(contractors)**

- 14.1 BP shall inform the contractor that the workplace contains permit required confined spaces and that permit space entry is allowed only through compliance with this procedure. This can be done through contractor orientation.
- 14.2 The performing authority or designee must appraise the contractor of the elements that make the space in question a confined space along

with any hazards identified and precautions or procedures in place to protect entrants. This can be done during the review of the WCC-Permit.

- 14.3 The performing authority and contractor both have responsibility to coordinate entry operations, when both BP personnel and contractor personnel will be working in or near the permit-required confined space.
- 14.4 The performing authority or designee must discuss with the contractor at the end of the job any hazards within the confined space that were created or observed.
- 14.5 The contractor company is responsible for obtaining information regarding permit required confined space hazards and BP confined space entry procedures.
- 14.6 The contractor company must inform the BP performing authority of the permit-required confined space program they will follow if their program is different than the BP confined space program.

15.0 Non-Entry Rescue Requirements

- 15.1 To facilitate non-entry rescue, each entrant must wear a full body harness with a lifeline attached to the D-Ring in the center of the wearer's back. Wristlets may be used in place of the full body harness if wristlets are safer and more effective than the full body harness. The lifeline must be attached to a mechanical device or fixed point outside of the confined space so that rescue can begin as soon as necessary. A mechanical device needs to be available to retrieve personnel from vertical type permit spaces more than 5 feet deep when non-entry rescue is used.
- 15.2 The non-entry rescue requirement may be exempted by the performing authority if it is determined that the presence of the lifeline poses a greater hazard than the benefits it offers or would not contribute to the rescue of entrants. The following guidance is offered to help in making this determination:
 - The use of a lifeline is not required if the permit-confined space has obstructions or turns that would prevent the pull on the retrieval line from being transmitted to the entrant. (*i.e. towers, large baffles or obstructions, multiple entrants where the lifelines cannot reasonably be kept separated and would become entangled, etc.*)
 - The use of a lifeline is not required if the entrant would be injured during a rescue attempt because of forceful contact with projections in the confined space - (*i.e. towers, scaffolds where the entrant is working at elevation and, if non-entry rescue is used, would be pulled off elevation, etc.*)
 - The use of a lifeline is not required if the permit confined space is being entered by an entrant using an airline respirator and the lifeline cannot be controlled so as to prevent entanglement hazards with the airline.
 - The use of a lifeline is not required in a Reclassified Confined Space.

16.0 Planning and

- 16.1 Prior to confined space entry, the space must be evaluated by a

Notification for Rescue

member of the confined space rescue team so a rescue plan can be developed and the information added to the active confined space list. The performing authority is responsible for contacting the rescue team for this evaluation.

- 16.2 A list of active confined spaces will be maintained by the safety department. This list will contain, at a minimum, the following information: area, job description, description of confined space, hours to be in space (ex., 7:00am to 5:00pm), BP supervisor, radio channel, contractor company and a contractor contact. This list will be posted in the emergency operating center.
- 16.3 The Performing Authority (maintenance supervisor), Area Authority, or project lead must call 6324 and leave a message stating the estimated time and dates the work will be going on in the space. The message can identify the work for that day, or it may be the schedule for the entire week. If they do not want to leave a message, they can contact the member of the safety department responsible for coordinating the active confined space list with the information.
- 16.4 The confined space rescue plan will be posted by the confined space entrance along with the confined space permit and emergency notification plan whenever the space is entered.
- 16.5 If the entry into a permit-required confined space is only with hands and arms, the following are not necessary: a rescue plan, confined space rescue team, entrant harness requirement, and the notification of the safety department for inclusion of the space onto the active confined space list.

Emergency Response Notification Procedure

- 16.6 The Emergency Response Notification Plan must be completed and posted at the confined space as information on how attendants activate the confined space rescue team. This notification plan is available on the BP Toledo website.
- 16.7 In case of emergency, the confined space attendant goes to radio channel 16A and notifies the refinery coordinator or security of the emergency. The attendant then notifies the operator in that area of the emergency.
- 16.8 The refinery coordinator notifies security (or vice-versa) of the emergency. The refinery coordinator then calls the operator in the unit of the emergency to inform them that the emergency response team is in route.
- 16.9 Security contacts the BP Emergency Response Team either on 14A or via the page-out system to notify them of the confined space emergency. Security also contacts Oregon Fire if necessary.
- 16.10 Security or the refinery coordinator arrange an escort for Oregon Fire to the area of the rescue.
- 16.11 If a third party firm is hired to provide confined space rescue services, they must have a radio and monitor 16A. Emergency calls will come

into 16A and when the rescue team hears the call, they immediately dispatch to the site of the confined space emergency.

17.0 Rescue Team

Rescue Service Requirements

- 17.1 The Refinery shall have an in-plant rescue team or an arrangement under which an outside team will respond to a request for rescue service.
- 17.2 A qualified confined space rescue service must be available on-site whenever Permit Required Confined Space entry is taking place.
- 17.3 A confined space rescue service is **not** required to be on-site for Reclassified Confined Space entry.
- 17.4 BP Toledo Refinery or the contractor working in the space may hire a qualified outside agency to provide confined space rescue service when the BP Emergency Response Team is not available. To be qualified for confined space rescue, the outside agency must meet the standards defined in OSHA regulation 29 CFR 1910.146(k)(2) Rescue and Emergency Services and be evaluated by BP and/or the contractor per 1910.146(k)(1) and 1910.146 Appendix F.
- 17.5 When contractor employees are entering a confined space, the contractor is responsible for assuring a rescue plan is in place to protect their employees. With prior agreement from BP management, contractors may use the BP Emergency Response Team or a qualified outside agency hired by the contractor doing the work or BP for confined space rescue.
- 17.6 The qualified confined space rescue team is responsible for developing a confined space rescue plan for each space they are overseeing. The Confined Space Rescue Plan template must be used and is available on the BP Toledo webpage. The rescue plan must contain, at a minimum, the rescue procedure and equipment or PPE required for rescue. If an outside agency is performing the service, they must provide the equipment necessary for rescue as defined by the plan unless other arrangements have been made.
- 17.7 A rescue team must consist of at least two people for entry, both trained in confined space rescue, and an attendant. Based on the specific confined space, more people may be required for rescue, and this should be noted in the rescue plan.
- 17.8 There is no pre-determined limit to the number of confined spaces one rescue team can oversee. The spaces need to be evaluated by the rescue team and the team makes the decision about how many spaces they can handle. If the team is three people or less, provisions must be

in place to have everyone working in confined spaces evacuate them immediately if the rescue team is activated. If there is more than one rescue team, or more than three people trained in confined space rescue with rescue equipment available, then confined space work can continue even if a rescue is going on in one space. The confined space rescue team is responsible for notifying the appropriate people to ensure that workers/attendants at other confined spaces know the rescue team has been activated and that all other confined space work must cease.

- 17.9 Entry into IDLH atmospheres requires rescue services to be assembled at the entry point and prepared so rescue can begin immediately. Rescue personnel for IDLH must meet the requirements of Section 4.0 Entry into a lethal atmosphere (IDLH/INERT).

Rescue team training:

- 17.10 Personnel assigned to a confined space rescue team must be provided with and trained to use the PPE and rescue equipment necessary for making rescues from confined spaces in the refinery.
- 17.11 The rescue team must be trained to perform the assigned rescue functions and must have received the same training as authorized entrants.
- 17.12 Training must comply with OSHA standard 29 CFR 1910.146 (k)(2).
- 17.13 At least one member of each rescue team must maintain current certification in first aid and CPR skills.
- 17.14 The rescue team must practice making permit required confined space rescues at least once every 12 months, either from the actual permit spaces or from representative permit spaces.
- 17.15 In the event outside rescue is called, local management shall ensure that the designated rescuers are aware of the hazards they may confront when called on to perform rescues at the refinery, so that the outside rescue team can equip, train and conduct itself appropriately.
- 17.16 Documentation of the rescue team's training and drills must be maintained and made available to BP upon request.

18.0 Training

- 18.1 Persons responsible for issuing and accepting confined space entry permits shall have proper training on the preparation of confined space for maintenance.
- 18.2 Attendants and entrants shall receive training on proper execution of their respective duties. They shall receive initial training. Re-training will be given to appropriate personnel whenever there is a change in

assigned duties, if a space presents a hazards in which they were not previously trained, if deviations from this procedure are discovered in review of the confined space program, or when this procedure is updated.

18.3 Contractors will ensure that their employees are knowledgeable in this confined space standard and all BP contractor safety rules.

19.0 Review of program

19.1 The confined space entry program shall be reviewed when local management has reason to believe that the measures in place are not protecting employees. Examples that may prompt a review include: unauthorized entry into a space, occurrence of an injury or near-miss during entry, detection of a condition prohibited by the permit, detection of a hazard not covered by the permit, or an employee complaint about the effectiveness of the program.

19.2 The confined space permit program will be reviewed at least annually through a review of the canceled permits. This review is to ensure employees participating in entry operations are protected from confined space hazards.

20.0 Record Keeping

20.1 The permit shall be kept for a period of two (2) years from the issue date on the specific unit or area responsible in a designated location. All confined space permits, gas test sheets, entrants and attendants sheets, and confined space rescue plans should be returned to the maintenance coordinator for archiving when the job is complete.

21.0 Deviations

21.1 Any deviations from this procedure shall be approved through a Management of Change.

21.2 Turnarounds, Special Projects, Greenfield or Brownfield work may be exempt from specific elements of this procedure provided they have a written plan that addresses Confined Space Entry and meets all OSHA requirements. The plan must be approved by the Site Operations Manager, HSSE Manager, the Project & Maintenance Manager and the COW Technical Authority.

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