
HEALTH AND SAFETY PROCEDURE 202 – Confined Space Entry

1.0 Purpose

- 1.1 The purpose of this procedure is to establish minimum requirements for the safety and health of employees and contractors who work in and in connection with confined spaces.

2.0 Scope

- 2.1 The procedure provides minimum safety requirements to be followed while entering, exiting, and working in confined spaces at ambient atmospheric pressure in accordance with 29 CFR 1910.146 and 29 CFR 1926 Subpart AA.

3.0 Definitions

- 3.1 **Attendant:** A person assigned to monitor a confined space process or operation and provide support or react as required for the safety of the entrants.
- 3.2 **Blinding:** Inserting a solid barrier across the open end of a pipe, line, or duct or in between two flanges leading into or out of the confined space and securing the barrier in such a way as to prevent leakage of material into the confined space.
- 3.3 **Confined Space:** An enclosed area that has the following characteristics:
- 3.3.1 Large enough and configured to allow a person to bodily enter.
 - 3.3.2 Its primary function is other than human occupancy.
 - 3.3.3 Has restricted entry and exit. (Restricted entry and exit is a physical configuration that requires the use of the hands for support or contortion of the body to enter into or exit from a confined space.)
- 3.4 **Construction:** building a new structure or upgrading an old one.
- 3.5 **Continuous Monitoring:** The uninterrupted use of a direct reading instrument to monitor a confined space.

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- 3.6 **Control of Hazardous Energy:** the placement of a lock/tag on an energy isolating device in accordance with established procedures.
- 3.7 **CSRT:** Confined Space Rescue Team.
- 3.8 **Direct Reading Instrument:** a real-time air monitoring device used to verify suitable atmospheric conditions for confined space entry.
- 3.9 **Double Block and Bleed:** a method used to isolate a confined space from a line, duct, or pipe by physically closing two main valves on a piping system and opening a vented-to-atmosphere valve between them.
- 3.10 **Emergency:** Any occurrence inside or outside of the confined space that could endanger the entry team.
- 3.11 **Engulfment:** the surrounding and effective capture of a person by a liquid or flowable solid substance.
- 3.12 **Entrant:** a person authorized by the Entry Supervisor who enters a confined space to perform an assigned task.
- 3.13 **Entry:** ingress by persons into a confined space, which occurs upon breaking the plane of the confined space portal with any part of the body. Entry includes all periods of time in which the confined space is occupied.
- 3.14 **Entry Portal:** point of access to enter a confined space.
- 3.15 **Entry Supervisor:** due to the extensive knowledge, skills, and experience, this individual is given the authority and responsibility to direct and implement all aspects of the confined space entry operation.
- 3.16 **Hard Barricade:** Any rigid material or device that is attached to the opening of a Confined Space in a means that requires tools to remove and prevents unauthorized entry into the space.
- 3.17 **Hazard:** a condition or potential condition or inherent characteristic of an activity or circumstance that can produce injury, illness, death, or property damage.

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- 3.18 **Hazardous Atmosphere:** an atmosphere that exists or has the potential to exist and causes serious harm or death to occupants by reason of: oxygen deficiency or enrichment; flammability or explosivity by gas, vapor dust; or toxicity.
- 3.19 **Horizontal Rescue:** methodology to move the entrant to safety while the entrant's weight is supported by the surface of the space's floor or other horizontal level within the space.
- 3.20 **Hot Work:** Work that produces arcs, sparks, flames, heat or other sources of ignition.
- 3.21 **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 permitted space.
- 3.22 **Inerting:** The displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. NOTE: the process of displacing oxygen creates an IDLH oxygen-deficient atmosphere. Westlake personnel shall not enter inert atmospheres. In the event a Confined Space shall be entered under an inert atmosphere, it shall be contracted to a vendor who specializes in such Work.
- 3.23 **Isolation:** a process of physically interrupting, disconnecting, or removing pipes, lines and energy sources such as electrical, pneumatic, and gravitational forces from entering the confined space.
- 3.24 **Lower Explosive Limit:** the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in the presence of an ignition source (arc, flame, heat).
- 3.25 **Oxygen Deficient Atmosphere:** an atmosphere containing less than 19.5% oxygen by volume.
- 3.26 **Oxygen Enriched Atmosphere:** an atmosphere containing more than 23.5% oxygen by volume.

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- 3.27 **Occupational Exposure Limit (OEL):** the allowable air contaminant level established by Westlake Chemical in Plaquemine, Louisiana.
- 3.28 **Permit Required Confined Space (PRCS):** all confined spaces at Westlake Plaquemine shall require a Confined Space Entry Permit to enter.
- 3.29 **Permit System:** a written procedure for preparing and issuing authorization (permits) for entry and for returning the permit, which requires confined space PRCS to service following termination of entry.
- 3.30 **Periodic monitoring:** the use of a direct reading instrument to monitor a confined space at fixed intervals (every hour).
- 3.31 **Qualified Person:** a person who by reason of training, education, and experience, is knowledgeable in the operation to be performed and is competent to judge the hazards involved and specify controls and/or protective measures.
- 3.32 **Rescue:** assistance in exiting the confined space by providing assistance to the entrant by the rescuer(s) to effect exit from the space.
- 3.33 **Rescue Team:** a team of qualified technical rescue responders with the training, expertise, and equipment to readily provide emergency rescue.
- 3.34 **Self-Rescue:** an unaided emergency exit out of a confined space. This action may result from the entrant's own decision or by a command from outside the space.
- 3.35 **Toxic Atmosphere:** an atmosphere containing a concentration of a substance above the published or otherwise known acceptable levels.
- 3.36 **Upper Explosive Limit:** highest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in the presence of an ignition source (arc, flame, heat).
- 3.37 **Vertical Rescue:** methodology to move the entrant to safety while all or a portion of the entrant's weight is supported by a life-safety rope or wire. This methodology would include diagonal rescue, where a portion of the entrant's weight is supported by a surface within the space.

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4.0 Responsibilities

4.1 Health & Safety

- 4.1.1 Ensure the procedure is in compliance with the latest regulatory requirements
- 4.1.2 Approve Class A and B entries
- 4.1.3 Certify the Entry Supervisor
- 4.1.4 Approve variances associated with this procedure
- 4.1.5 Audit the confined space program for compliance
- 4.1.6 Maintain historical confined space permits

4.2 Unit Department Managers

- 4.2.1 Ensure compliance with this procedure
- 4.2.2 Implement of this procedure
- 4.2.3 Provides equipment needed to implement this procedure. (Signs, hard barricade, COHE equipment, etc...)

4.3 Supervision:

- 4.3.1 Assist in the certification of Entry Supervisors.

4.4 Entry Supervisor:

- 4.4.1 Evaluate the conditions in and around any permit space to be entered.
- 4.4.2 Oversee entry conditions, as necessary, to determine if the entry conditions are acceptable for entry.
- 4.4.3 Where acceptable entry conditions are present, either authorize entry to begin or allow existing entry operations to continue.
- 4.4.4 Take necessary measures to protect personnel from permit hazards.
- 4.4.5 Have the authority to terminate the entry.
- 4.4.6 Conducts Initial Atmospheric Monitoring, ensuring the space from top to bottom and all areas are sampled.
- 4.4.7 Checks all communication equipment that will be used in an emergency.
- 4.4.8 Ensures all equipment needed for entry is on-site (hard barricade)

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4.5 Authorized Entrant

- 4.5.1 Know the task to be performed and the hazards of the space, including the mode, signs, and symptoms of exposure.
- 4.5.2 Know how to properly use equipment, including any testing equipment, ventilating, communication, PPE, and other necessary equipment.
- 4.5.3 Apply a "Blue" individual lock on the designated lock box prior to entering the space where applicable.
- 4.5.4 Communicate with the attendant as necessary.

4.6 Attendant

- 4.6.1 An individual stationed outside one or more permit spaces who monitors the authorized entrants.
- 4.6.2 Required to perform all attendant's duties outlined in this and the employer's procedure, whichever is more stringent.

5.0 Procedure

5.1 Identification

- 5.1.1 All confined spaces at the site shall be designated as Permit Required Confined Spaces. This includes new construction.
- 5.1.2 When a Permit Required Confined Space is altered to the point of omitting at least one of the criteria for a confined space, it is no longer designated as a confined space.

NOTE: Even though the space is no longer a confined space, all hazards must be identified, evaluated, and mitigated.

5.2 Hazard Management

5.2.1 Hazard Identification

- 5.2.1.1 Hazards shall be identified for each confined space prior to entry.

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5.2.1.2 Hazard Types

- Physical Characteristics (i.e., configuration)
- Existing or potential Atmospheric Hazards
 - Oxygen-deficient or enriched atmosphere
 - Flammable/Explosive atmosphere
 - Toxic Atmosphere
- Biological Hazards (i.e., bacteria growth)
- Mechanical Hazards (i.e., rotating equipment)
- Physical Hazards (i.e., hot equipment, electrical)
- Chemical Hazards (i.e. VCM, EDC, Chlorine)
- The review of the toxic effects and symptoms of exposure to chemicals is communicated to entrants via site-specific training.

5.2.2 Hazard Evaluation:

5.2.2.1 Hazards identified shall be evaluated by a qualified person. Each hazard shall be examined with respect to:

- Potential of hazard exposure
- Magnitude of the hazard
- Likelihood of hazard occurrence
- Consequences of the hazard occurrence
- Potential for changing conditions or activities

5.2.3 Controlling Hazards:

5.2.3.1 Hazards shall be eliminated or controlled to achieve an as low as reasonably practicable level prior to conducting confined space entries. The following hierarchy of control shall be followed:

- Eliminate the hazard
- Engineering Controls (substitution, isolation, etc.)
- Administrative Controls (work practices, procedures, personnel assignments, etc.)
- Personal protective equipment

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5.3 Confined Space Classification

5.3.1 A confined space must be designated as A, B, or C based upon atmospheric testing prior to entry or known potential atmospheric hazards. Appendix A – Confined Space Classification Table and Appendix B - Confined Space Toxic Atmosphere Summary shall be used to help determine classification.

5.3.2 Class A & B entries require approval from the Health & Safety Department.

5.3.3 Westlake & Contract employees are not allowed to enter Class A confined spaces. If a Class A Confined Space must be entered, a variance shall be required.

5.3.4 Excavations to a depth greater than 4ft shall require a Confined Space permit for entry.

5.3.5 All entry into tank cars and barges shall require a Confined Space permit.

NOTE: This does not include for rescue purposes.

5.4 Duties of the Entry Team

5.4.1 Attendant

5.4.1.1 The number of attendants needed shall be determined by the Entry Supervisor who shall consider the manpower necessary to carry out the duties.

5.4.1.2 The Entry Supervisor shall ensure that each attendant:

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of exposure
- Is aware of possible behavioral effects of hazard exposure in authorized entrants

5.4.1.3 Continuously maintains an accurate count of authorized entrants in the permit space by documenting name, company, and time in and out on the confined space entry permit.

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- 5.4.1.4 Is stationed immediately outside the point of entry/exit of the confined space to observe the PRCS and be able to communicate with the occupants throughout the entry.
- 5.4.1.5 Before employing any portable gas detection used for continuous, periodic, or personal atmospheric monitoring, the attendant will ensure the calibration and bump test are current. (Calibration shall be monthly and bump tested within twenty-four (24) hours).
- 5.4.1.6 Monitors activities inside and outside the space to determine if it is safe for authorized entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:
 - If the attendant detects a prohibited condition.
 - If the attendant detects the behavioral effects of hazard exposure in an authorized entrant.
 - If the attendant detects a situation outside the space that could endanger the authorized entrant.
- 5.4.1.7 Summons rescue team as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
- 5.4.1.8 Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:
 - Warn the unauthorized persons that they must stay away from the permit space.
 - Advise the unauthorized persons that they must exit immediately if they have entered the permit space.
 - Inform the authorized persons and the Entry Supervisor if unauthorized persons have entered the permit space.
- 5.4.1.9 Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

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5.4.2 Entrant

- 5.4.2.1 Shall know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- 5.4.2.2 Shall properly use equipment as described in section 5.15 Auxiliary Equipment.
- 5.4.2.3 Shall communicate with the attendant as necessary to enable the attendant to monitor entrant status and to allow the attendant to alert entrants of the need to evacuate the space.
- 5.4.2.4 Shall alert the attendant whenever:
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
 - The entrant detects prohibited conditions.
- 5.4.2.5 Shall exit from the permit space as quickly as possible whenever:
 - An order to evacuate is given by the attendant or the Entry Supervisor.
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
 - The entrant detects a prohibited condition.
 - An evacuation alarm is activated.
- 5.4.2.6 Shall self-recue when possible.

5.4.3 Entry Supervisor

- 5.4.3.1 Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- 5.4.3.2 Verify by checking that the appropriate entries have been made on the permit, that all tests specified by the permit

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have been conducted, and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.

- 5.4.3.3 Terminate the entry and cancels the permit.
- 5.4.3.4 Verify that rescue services are available and that the means for summoning them are operable. Ensures the pre-plan has been completed.
- 5.4.3.5 Verify isolation for the shift for which the permit is being written.
- 5.4.3.6 Communicate the status and requirements of the entry to other Entry Supervisor(s) whenever the Entry Supervisor is changed. (See Transfer of Authority section 5.5.10)
- 5.4.3.7 Must have the understanding, knowledge, and skills to test or monitor the permit space to ensure conditions in the permit space are acceptable before entry is authorized to begin.
- 5.4.3.8 Tests or monitors the permit space as necessary to determine if acceptable entry limits are being maintained.
- 5.4.3.9 Immediately records test results on the permit.
- 5.4.3.10 Installs a hard barricade at all entry points of the space when the entry is no longer active.

5.5 Permit Required Confined Spaces (PRCS) Permit System

- 5.5.1 All entry into confined spaces shall be permitted utilizing the site's Confined Space Entry Permit. See Appendix D – Confined Space Entry Permit.
- 5.5.2 Before each entry, a Confined Space Entry Permit shall be completed and signed by the Entry Supervisor at the entry portal.

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- 5.5.3 The field copy (yellow) must be available at the entrance of the confined space, along with the safe work permit and any additional permits if necessary.
- 5.5.4 Entry requirements identified on the permit shall be communicated to entrants and attendant during the Pre-Entry Conference.
- 5.5.5 All subsequent entrants that enter the space after the Pre-Entry Conference must review the contents of the Confined Space Entry Permit prior to entry.
- 5.5.6 The Confined Space Entry Permit is valid for no more than one maintenance shift. One 2-hour extension of the permit will be allowed.
- 5.5.7 All entrants may enter the PRCS utilizing one permit.
- 5.5.8 Each person or workgroup must present a Safe Work Permit to the attendant prior to entering or conducting Work inside the PRCS.
- 5.5.9 Signatories:
 - 5.5.9.1 The Entry Supervisor signs in the Atmospheric Monitoring section of the permit after conducting the initial atmospheric monitoring and verifying acceptable atmospheric conditions for entry.
 - 5.5.9.2 The attendant signs the permit after reviewing and accepting responsibilities for attending the permitted entry. Upon beginning duties, the attendant signs the Entry Log and documents the time on the job. If the attendant is relieved of duties, the time off shall be documented. Any subsequent attendant shall document time on and time off. The attendant will document the entrant's name, company, time in, time out, and atmospheric monitoring data.
 - 5.5.9.3 Entry Supervisor authorizes entry by signing the permit at the entry portal after verifying the following:
 - Equipment preparation is complete.

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- Confined space is isolated per this procedure.
- All initial atmospheric monitoring is conducted and documented.
- Ventilation plans documented and implemented.
- An attendant is present, has all necessary equipment, and understands his duties.
- No hoses or other connections are present that could introduce hazardous chemicals into the space.
- The space is now safe to enter.

5.5.10 Transfer of Authority

5.5.10.1 When responsibility for a permit space entry is transferred to a new Entry Supervisor, the Current Entry Supervisor and the Accepting Entry Supervisor shall sign the field copy of the confined space entry permit to transfer responsibility.

5.5.11 If the Unit/Plant Alarm sounds, the following shall be required:

- The space must be evacuated.
- The Confined Space permit may be re-issued once "All Clear" has been given.
- Initial Monitoring by the Entry Supervisor shall be conducted before the Confined Space Permit is re-issued.
- The field copy of the Confined Space Permit shall be returned to the Entry Supervisor once the permit time is complete.

5.6 Atmospheric Monitoring

5.6.1 Initial Monitoring:

- 5.6.1.1 Before entry into a confined space, atmospheric monitoring shall be conducted for hazardous atmospheres by the Entry Supervisor.
- 5.6.1.2 Initial monitoring of the atmospheric conditions shall be conducted near and at the entry portal and in all areas where entrants will be present or working, and results shall be documented.

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5.6.1.3 Ventilation shall be shut down for a minimum of fifteen (15) minutes before initial monitoring is conducted.

5.6.1.4 Initial monitoring shall consist of:

- Oxygen between 19.5% - 23.5 %
- Lower Explosive Limit (LEL) less than or equal to 1
- Carbon Monoxide (CO)
- Toxicity (less than Permissible Exposure Limit - PEL)
- The meter type and serial number must be documented on the permit.

See Appendix B - Confined Space Toxic Atmosphere Summary.

5.6.1.5 Atmospheric monitoring shall follow the rule of two (2) minutes of sampling time plus two (2) seconds of sampling time for every foot of extension (tubes or probes) unless the meter's manufacturers' recommendation is more stringent.

5.6.1.6 Initial monitoring performed with Gastec direct reading tubes (for Hydrochloric Acid and Sulfuric Acid) shall be collected using the tubing from a continuous monitor after the two-plus minutes of sampling has been performed.

5.6.1.7 Whenever testing of the atmosphere indicates that levels of oxygen, flammability, or toxicity are not within acceptable limits, entry shall be prohibited until appropriate controls are implemented.

5.6.1.8 If continuous or periodic atmospheric monitoring has not started within thirty (30) minutes after the initial atmospheric monitoring, the entry is suspended, ventilation must be cut off for fifteen (15) minutes, and initial monitoring by the Entry Supervisor must be conducted again before entry.

5.6.2 Continuous Monitoring:

5.6.2.1 Confined space atmospheres shall be continuously monitored by the attendant as close as possible to the work zone recording the data every one (1) hour on the CSE Log.

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- 5.6.2.2 Continuous monitoring shall test for the same elements as initial monitoring.
- 5.6.2.3 The attendant's first log of atmospheric monitoring shall be recorded immediately upon arrival at the space.
- 5.6.2.4 If any confined space is vacated (no entrants) and no atmospheric monitoring is conducted for thirty (30) minutes, the entry is suspended, ventilation must be cut off for fifteen (15) minutes, and initial monitoring by the Entry Supervisor must be conducted before re-entry.
- 5.6.2.5 Anytime a Direct Reading Instrument's alarm sounds for a reason other than a pump failure:
 - All entrants must exit the space.
 - The Entry Supervisor must evaluate, rectify, and document the complaint on the Confined Space Entry Permit in the Comments section before re-entry.
 - The Entry Supervisor shall conduct initial monitoring prior to re-entry.

NOTE: If a pump failure cannot be cleared, entrants must exit the space until monitoring can be resumed.

- 5.6.2.6 If an entrant has a complaint about the atmosphere of a confined space:
 - All entrants must exit the space.
 - The Entry Supervisor must evaluate, rectify, and document the complaint on the Confined Space Entry Permit in the Comments section before re-entry.
 - The Entry Supervisor shall conduct initial monitoring prior to re-entry.

5.7 Periodic Atmospheric Monitoring:

- 5.7.1 If activities such as hydro or abrasive blasting are conducted inside the space, the attendant shall monitor the space on a periodic basis, recording the data every (1) hour on the CSE Log.

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- 5.7.2 Personal atmospheric monitoring may be discontinued during activities that could damage the Direct Reading Instrument.
- 5.7.3 For chemicals for which there are no direct reading instruments, such as hydrogen chloride or sulfuric acid, periodic monitoring shall be performed using the appropriate Gastec tube. The Direct Reading Instrument shall be used for all other monitoring activities. This information shall be recorded on the CSE log, along with the initial monitoring results.
- 5.8 Personal Atmospheric Monitoring:
 - 5.8.1 At least one entrant working per work zone inside the confined space shall wear a personal atmospheric monitor. The Entry Supervisor will determine the quantity and location of the personal atmospheric monitors.
- 5.9 Atmospheric Monitoring Equipment:
 - 5.9.1 The Entry Supervisor will ensure the calibration and bump test are current before employing portable gas detection equipment. (Calibration shall be monthly and bump tested within 24 hours). The calibration information shall be documented on the Confined Space Permit.
- 5.10 Isolation and Control of Hazardous Energy:
 - General:
 - 5.10.1 All energy sources that are potentially hazardous to confined space entrants shall be secured, relieved, disconnected and/or restrained before personnel are permitted to enter the confined space.
 - Isolation:
 - 5.10.2 Methods and means shall be selected and used to prevent flammable, explosive, toxic, irritating, or oxygen-displacing gases, vapors, liquids, and solids from entering the space.
 - 5.10.3 A confined space shall be isolated to prevent entry of material(s) and hazardous contaminants using one or more of the following methods:

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- Inserting a blind between two flanges, sized for the proper pressure in piping nearest to the confined space.
 - If blinding nearest the confined space cannot be achieved, Unit Manager approval shall be required on the Confined Space Permit.
 - If a double block and bleed is used for isolation, Unit Manager approval shall be required on the Confined Space Permit.
 - Depressurizing and disconnecting contaminant supply line(s) and providing a blind on piping sized for the pressure leading into the confined space.
 - Misaligning pipe(s) at connections closest to the confined space and/or capping, blinding and/or plugging ends. These openings must be documented on the isolation list.
 - Pipe or similar conveyances between the confined space and isolation point (s) shall be drained, cleaned, or flushed of hazardous material and known hazardous contaminants as necessary.
- 5.10.4 Precautions shall be taken to ensure that, when drains, vents, or piping are left open, the reversal of flows, air contamination from adjacent processing, or chemical handling cannot enter the confined space.
- 5.10.5 In confined spaces where complete isolation is not possible, provisions shall be made to isolate the space to the best extent possible and control all other processes to ensure the entry team is not in danger. An evaluation should be conducted per Section 5.2 Hazard Management.
- 5.10.6 Special precautions shall be taken when entering double-walled, jacketed, or internally insulated confined spaces that may discharge hazardous material through the vessel's internal wall.
- Lockout/Tagout:
- 5.10.7 Machines, equipment, or processes shall be locked, tagged, or both per HSP 317 – Control of Hazardous Energy.

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5.11 Hot Work in Confined Spaces

5.11.1 Hot Work shall not take place on the outside or inside of a Confined Space until the equipment has been cleaned and atmospheric testing results meet safe entry requirements as required by this procedure.

5.12 Ventilation

5.12.1 A ventilation plan is required for all confined space entries and must be kept with the confined space permit.

5.12.2 Air movers or other means of introducing air into the space shall be placed in such a manner to minimize the possibility of introducing air contaminants, which may create unacceptable limits (e.g., carbon monoxide).

5.12.3 If welding, cutting and/or brazing takes place inside a Confined Space, ventilation shall provide a minimum of 2000 cfm per welder. If a minimum of 2000 cfm cannot be achieved or maintained, each person inside the Confined Space shall wear fresh air.

5.12.4 If natural ventilation is used, it shall be documented on the ventilation plans.

5.12.5 The air supply for ventilation shall be from a clean source and may not increase the hazards in the space. Plant air shall not be used for ventilation equipment, because it is backed up by nitrogen.

5.12.6 Ventilation shall be maintained during the entire entry.

5.12.7 Ventilation equipment shall be bonded and grounded to eliminate static energy. Ductwork shall not cause tripping hazards or blocked exits. The Entry Supervisor shall ensure the ventilation system reflects sound ventilation principles of supplying enough clean make-up air and controlling the exhaust to prevent creating hazards in other areas.

5.12.8 The Entry Supervisor shall contact the Industrial Hygiene or HSE Department when assistance is needed.

5.13 Cleaning Decontamination:

5.13.1 Confined spaces shall be cleaned and decontaminated of hazardous materials as the preferred method of eliminating or

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reducing exposure. Cleaning and decontamination shall be done to the extent feasible before entry.

- 5.13.2 Entry team members and equipment shall be decontaminated and cleaned as necessary during or after the confined space activity. Any disposable material or equipment used shall be properly discarded per appropriate standards. Entry team members shall be decontaminated per specific hazard protocol.

5.14 Personal Protective Equipment:

- 5.14.1 PPE for the Work being performed during entry shall be identified on the Safe Work Permit and Job Safety Analysis (JSA).

5.15 Auxiliary Equipment

- 5.15.1 Each entry and exit point shall be evaluated to determine the most effective methods and equipment enabling employees to safely enter and exit the confined space. Means for safe entry and exit shall be provided and used as prescribed by the Entry Supervisor throughout the duration of the entry.

5.16 Electrical Equipment

- 5.16.1 Tools, lighting, communication and test equipment which will be used in hazardous or classified locations should be listed, labeled or otherwise determined to be safe for the class and use by an accredited nationally recognized testing laboratory acceptable to OSHA or other authority having jurisdiction.
- 5.16.2 Where there is potential for electrical shock, appropriate electrical equipment or systems shall be used. This would include protection such as ground fault circuit interrupters (GFCI), assured grounding systems, double insulated tools and/or low voltage systems.

5.17 Safety Signs and Symbols:

- 5.17.1 All permit required confined space openings shall have a sign with the words "DANGER-PERMIT REQUIRED CONFINED SPACE."
- 5.17.2 When a confined space has an open entry portal and is unattended, the confined space sign must be visible and a hard barricade installed to prevent any entry.
- 5.17.3 If the unattended opening has a potential for fall hazard, the opening must be hard barricaded.

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5.17.4 When an inert gas (i.e. Nitrogen) is used for equipment preparation and entry portals are open, the open entry portals shall be hard barricaded and tagged with the identification of the inert gas used.

5.18 Emergency Response, Evacuation and Rescue

5.18.1 Types of Emergency Response

- Evacuation of the confined space when hazards are identified during an entry (self-rescue).
- Retrieval by trained crew members using non-entry methods.
- Rescue entry by trained emergency responders

5.18.2 Rescue Pre-Plan:

5.18.2.1 A rescue pre-plan must be developed by a CSRT member prior to any Confined Space Entry. The pre-plan must be documented on the Westlake Confined Space Rescue Pre-Plan (or equivalent) form in Appendix C.

5.18.2.2 The pre-plan may be completed in advance with the exception of the "CSRT on Site" section, which must be completed on the date of entry.

5.18.2.3 Security will facilitate availability of CSRT members for each shift.

5.18.2.4 Prior to the issuance of the Confined Space Entry Permit, the Entry Supervisor shall:

- Contact a CSRT member to authorize that the pre-plan is valid for conditions existing on day of entry
- Verify and document CSRT on site
- Alert CSRT members identified on pre-plan of confined space entry

5.18.2.5 A minimum of three (3) CSRT member must be on-site for each shift

5.18.2.6 At least one member of the Rescue team listed on the Pre-Plan shall be a Medical First Responder

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5.18.2.7 The Confined Space Rescue Pre-plan must be communicated to the Entry Team at the Pre-Conference Meeting.

5.18.2.8 A copy of the Pre-plan must be with the confined space permit and the original copy with operations.

5.18.3 Rescue Procedures:

5.18.3.1 When a rescue becomes necessary the attendant:

- Will sound four short blasts from an alarm horn during an emergency.
- Will immediately summon the Rescue Team via plant radio.
- Stay at the entry until the Rescue Team arrives.

NOTE: The attendant shall not under any circumstance enter the confined space to rescue the employee inside.

15.18.3.2 All confined space activities in the facility shall stop until the "All Clear" has been given.

15.18.3.3 The CRST team will evaluate the conditions of the confined space to determine if the confined space is safe for entry rescue.

15.18.3.4 The CRST team will rescue entrants as required.

6.0 Training:

6.1 Frequency of Training:

- Before the employee is assigned to this role.
- Before there is a change in role or duties.
- When there is a change in the permit operations that introduces a hazard that was not previously known.
- When the employees show a deficiency in their knowledge and skills associated with their assigned Entry Team Role.

6.2 Training shall be developed as to provide the knowledge and skills in accordance with this procedure and will be revised to reflect deficiencies and new regulatory requirements.

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- 6.3 The Entry Team shall be trained to acquire the understanding, knowledge, and skills necessary to perform their role.
- 6.4 Employees assigned to the Entry Team shall be certified through the following process:
- Entry Supervisor shall be certified through the Permit Writer Certification. (HSP- 207)
 - Attendants shall be certified by their employer. Each employer shall be able to provide certification documentation upon request.
 - Entrants shall be certified by their employer. Each employer shall be able to provide certification documentation upon request.

6.5 Confined Space Rescue Team

6.5.1 Minimum training requirements:

- Rescue Level 1
- Incident Command system
- Confined Space Entry requirements
- Respiratory Protection
- Search and rescue techniques
- Patient packaging
- Mechanical advantage
- Specific chemical properties and hazards

6.5.2 To remain active on the Confined Space Rescue Team, members will practice making confined space rescues at least once a year:

- Simulating rescue operations.
- Removing personnel through representative confined space openings.
- Record Retention and Program Review

7.0 Record Retention

- 7.1 Confined Space Entry Permits will be retained by the production departments and sent to the HSE Department every month.
- 7.2 The HSE Department will retain all Confined Space Entry Permits and associated forms for one year. If monitoring results show toxic substances, harmful agents above the permitted exposure levels, or changes in a

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Confined Space atmosphere during entry into the Confined Space, regardless of any PPE or respirator usage. The permit shall be retained for thirty (30) years.

- 7.3 Training records are maintained in the Training Exchange electronic database.

8.0 Program Review

- 8.1 Westlake's Confined Space Entry Procedure will be reviewed annually. The HSE Department will ensure this review is performed.
- 8.2 The Safety Involvement Team will review the canceled confined space permits each quarter.

9.0 References

- 9.1 ANSI/ASSE Z117.1 – 2016 – Safety Requirements for Entering Confined Spaces
- 9.2 29 CFR 1910.146 Permit-required confined Spaces
- 9.3 29 CFR 1926 Subpart AA Confined Space in Construction

10.0 Appendices

- 10.1 Appendix A – Confined Space Classification Table
- 10.2 Appendix B – Confined Space Toxic Atmosphere Summary
- 10.3 Appendix C – Confined Space Rescue Pre-plan
- 10.4 Appendix D – Confined Space Permit (Sample)

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Revision History

Rev	Changes	Approved	Date
17	Complete Revision. Westlake Branding. See <i>MOC: PLQ0.EHSSPSM.090117.4192</i>	H. Garner	9/15/2017
18	Updated Review cycle to Annually	H. Garner	12/4/2019
N/A	Reviewed with no changes	H. Garner	12/8/2020
N/A	Reviewed with no changes. Confined Space Regulatory Assessment and documentation per HS Audit can be viewed in: Confined Space HSP 202 - Regulatory Assessment 120821 (1).docx	H. Garner	12/8/2021
N/A	Reviewed with no changes. Added new branding / logo.	H. Garner	08/22/2022
19	Added new information to meet PEMS minimum standards. Definitions: Hard Barricade, IDLH, & Inerting. Section 4.2 (Unit managers will provide equipment needed to implement procedure) Section 4.4 Entry Supervisors. 4.4.6 Will ensure space is monitored from top to bottom. 4.4.7 Checks all communication equipment that will be used in the event of an emergency. Section 4.5 Authorized Entrant 4.5.3 Must apply a "Blue" individual lock on lock box Section 5.2 Hazard Management 5.2.1.2. Must review toxic effects and symptoms of chemical exposure. Section 5.3 Confined Space Classification 5.3.4 Excavations greater than 4' will require a CS Permit 5.3.5 All entry into tank cars and barges will require a CS Permit Section 5.4.3 10 Entry Supervisors – Installs a hard barricade at all entry points of the space when the entry is no longer active. Section 5.6.1.4 Atmospheric Monitoring Updated with specific requirements for Oxygen, LEL, and Toxicity. Section 5.11 Hot work in Confined Spaces Section 5.12 Ventilation 5.12.3 Minimum of 2000 cfm per welder if hot Work is conducted in a CS. 5.12.4 Document natural ventilation if used. 5.12.5 Air Supply for ventilation must be from a clean source. Section 5.17 Safety Signs & Symbols Removed "red barricade" to require a hard barricade. MOC #: PLQ8.EHSSPSM.123123.77381	H. Garner	09/28/23

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Appendix A - Confined Space Classification Table

<i>Parameters</i>	<i>Class A</i>	<i>Class B</i>	<i>Class C</i>
<i>Characteristics</i>	<i>Immediately dangerous to life and health - rescue procedures require the entry of more than one individual fully equipped with life support equipment - maintenance of communication requires an additional standby person stationed within the confined space</i>	<i>dangerous, but not immediately life threatening - rescue procedures require the entry of one or more than one individual fully equipped with life support equipment - indirect visual or auditory communication with workers</i>	<i>potential hazard - requires no modification of work procedures - standard rescue procedures - direct communication with workers, from outside the confined space</i>
<i>Oxygen</i>	<i>16% or less</i>	<i>16.1% to 19.4% or greater than 23.6%</i>	<i>19.5% - 23.5%</i>
<i>Flammability Characteristics</i>	<i>20% or greater of LEL</i>	<i>10% - 19% LEL</i>	<i>0 % LEL</i>
<i>Toxicity</i>	<i>*IDLH</i>	<i>greater than contamination level, referenced in Appendix B's Occupational Exposure Limit Column</i>	<i>less than contamination level referenced in Appendix B's Occupational Exposure Limit Column</i>

*Immediately Dangerous to Life or Health - as referenced in NIOSH Registry of Toxic and Chemical Substances, Manufacturing Chemists data sheets, industrial hygiene guides, or other recognized authorities.

Note: Class A work is not permitted by Westlake & Contract Personnel unless for rescue purposes.

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Appendix B - Confined Space Toxic Atmosphere Summary

Chemical	Alarm Limits (ppm)	Occupational Exposure Limit (ppm)	15-minute STEL (ppm)	IDLH (ppm)
Carbon Monoxide (CON)	25	25	50	1,200
Chlorine (CL2)	0.5	0.5	1	10
Ethylene Dichloride (EDC) – 11.7 eV PID sensor	1	1	2	Ca
Hydrogen (H2)	10	SA	SA	NE
Hydrogen Chloride (HCL) - Gastec Tube 14L	2	NA	C 2	50
Lower Explosive Limit (LEL)	1%	NA	NA	NA
Oxygen (O2)	19.5 – 23.5%	NA	NA	NE
Sodium Hydroxide (Caustic)	NA	2 mg/m ³	2 mg/m ³	10 mg/m ³
Sulfuric Acid – Gastec Tube #35	Any	0.2 mg/m ³	NA	15 mg/m ³
Vinyl Chloride (VCM) – 10.6 eV PID sensor	2.5	1	5	Ca

ppm: parts per million

NA: Not Applicable

NE: Not Established

Ca: Cancer causing agent or cancer suspect agent

SA: Simple Asphyxiant, A substance that can cause unconsciousness or death by suffocation (asphyxiation) without other significant physiological effects.

C: Ceiling limit, A concentration that shall not be exceeded during any part of the working exposure.

IDLH - Immediately Dangerous to Life and Health.

CON – Carbon Monoxide Null – CO sensor which nullifies Hydrogen interference

Any – Any detectable color change on the Gastec tube



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Appendix C – Confined Space Rescue Pre-Plan

UNIT:	VESSEL ID:	PERMIT CLASS: A B C	PPE REQUIRED: Based on Rescue Requirements & Confined Space Class
SPACE TYPE: ☐ VESSEL ☐ PIPING ☐ EXCAVATION ☐ TANK ☐ TANK CARS ☐ HOPPER CAR ☐ MANHOLE ☐ PUMP ☐ BOILERS ☐ REACTOR ☐ SUMPS ☐ OTHER TYPE OF SPACE _____			
ENTRY TYPE: ☐ HORIZONTAL ☐ VERTICAL ELEVATED: ☐ YES ☐ NO CONGESTED: ☐ YES ☐ NO			
METHODS OF RESCUE: ☐ EXTERNAL ☐ INTERNAL ☐ HAULING SYSTEM ☐ VICTIM-LOWERING SYSTEM ☐ ANCHORAGE ☐ OTHER _____			
PRE-RIGGING REQUIRED? ☐ YES ☐ NO			
SPACE DESCRIPTION/RESCUE CONSIDERATIONS: (SKETCH OPTIONAL)		MEANS TO SUMMON CSRT ☐ RADIO ☐ PAGER ☐ AUDIBLE SIGNAL ☐ PLANT ALARM ☐ PHONE ☐ RED PHONE ☐ OTHER _____	
		Signature Instructions <i>"Date of Entry" must be same date as "Entry Date" on CSE Permit and signed by CSE Supervisor. "CSRT Approved"</i>	
		DATE OF ENTRY	
		ENTRY SUPERVISOR SIGNATURE	
		CSRT ON SITE NUMBER REQUIRED? _____	
		CSRT APPROVED:	
		DATE:	
		TIME:	
		SHIFT:	
		☐ NUMBER CSRT REQUIRED ARE ON SITE ☐ RESCUE AVAILABLE ☐ RESCUE STANDBY	
NOTES:			

	Westlake Chemical	No: 0001	CONFINED SPACE PERMIT					
Confined Space Name: _____		Department: _____						
Purpose for Entry: _____								
Pre-Entry Checklist	YES	N/A	Comments (N/A requires comments)					
Blind & Isolation List Field Verified, Tags Hung, and List Attached:								
Have All Hoses Used In The Cleaning Of The Process Equipment Been Disconnected?								
Has Initial Atmospheric Monitoring Been Conducted And Documented?								
Has Ventilation Been Installed And Activated?								
Pre-Entry Conference Held Between Oper., Maint. Supr., Entrants and Attendant:								
Confined Space Previously Contained: _____								
Potential Hazards: (✓ all applicable)								
☐ Corrosive Materials ☐ Flammable Materials ☐ Toxic Materials ☐ Falls	☐ Hot Equipment ☐ Cleaning (chemical or water lance) ☐ Wet Surfaces	☐ Pressure Systems ☐ No visual contact possible ☐ Oxygen Deficiency ☐ Other _____						
Entry Requirements (✓ all applicable)								
☐ Continuous Atmospheric Monitoring ** ☐ Periodic Monitoring (Document Hourly)** ☐ Continuous Ventilation ☐ Safety Harness ☐ Waiver Issued ☐ Lifelines ☐ Waiver Issued	☐ Review of Rescue Pre-Plan ☐ Communication Equipment ☐ Fire Extinguisher Located ☐ Safety Shower Located	☐ Personal Atmospheric Monitor _____ ☐ Personal Atmospheric Monitor _____ ☐ Other _____ ☐ Other _____						
** Must check either periodic or continuous monitoring								
Atmospheric Monitoring								
Time	Oxygen 19.5 - 23.5%	LEL 0%	CON < 25ppm	Toxic _____	Toxic _____	Instrument Name & ID Number	Instrument Cal Date	Entry Supervisor Signature
CONFINED SPACE CLASSIFICATION: A ☐ B ☐ C ☐								
(Check appropriate box based upon monitoring results. Class A or B entries require approval from Health and Safety)								
Confined Space Permit Valid Maintenance Shift Only Date: _____ Start Time: _____ End Time: _____								
Confined Space Authorization								
Entry Supervisor:			Signature: _____			Time: _____		Reissued: _____
Post Entry Conference Conducted								
Entry Supervisor:			Signature: _____			Time: _____		
Attendant:			Signature: _____			Time: _____		
Additional Approvals (as needed) See HSP-202 Confined Space Procedure								
Unit Manager:			Signature: _____			Time: _____		
Health & Safety:			Signature: _____			Time: _____		
Transfer of Authority								
Current Entry Supervisor:			Signature: _____			Time: _____		
Accepting Entry Supervisor:			Signature: _____			Time: _____		
Comments:								

white copy - Operations Original / yellow copy - Field Copy
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