



**SARNIA REFINERY**

**CONFINED SPACE ENTRY**

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**STANDARD**

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**SCOPE AND PURPOSE:**

The purpose of the Confined Space Entry standard is to clarify expectations in the identification, assessment and management of risks associated with work conducted in a confined space. Standards pertaining to other hazards within the confined space may also apply. Confined Space means a fully or partially enclosed space, that is neither designed nor constructed for continuous human occupancy, and in which atmospheric hazards may occur because of its construction, location or contents or because of work that is done in it.

**CONFINED SPACE ENTRY**

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## 1.0 ROLES & RESPONSIBILITIES

The following are positions with assigned responsibilities for work involving identification, assessment and control of risks associated with confined space entries:

**Suncor Area Owners** are responsible to ensure that confined spaces have been identified in their area of responsibility and take all reasonable precautions to test, verify conditions, and control access. They are responsible to verify and endorse (directly or through delegated authority) that safety has been considered in the planning process for confined space entries, that permit issuers are aware of confined spaces in their area, and that controls are established through the safe work permit and confined space entry assessment and planning form process.

**Suncor Permit Issuers** act on behalf of Area Owners and are responsible to:

- Follow identified responsibilities and procedure established for Safe Work Permitting.
- Ensure that Safe Work Permits generated for confined space entries have a clear reference to Confined Space Entry attribute on the face of the permit.
- Verify completion and signatories on the CSE Assessment and Planning Form.
- Ensure that any required gas testing is completed in support of the safe work permit to verify conditions as required.

**Project Manager / Planner** (includes both Planners and Construction Coordinators) are responsible to:

- Complete relevant sections of the Confined Space Entry Assessment and Planning Form.
- Consult with Operations Maintenance Coordinators, Operations personnel, Contractors, and a Rescue Team Representative through the assessment and planning process outlined in this standard.
- Establish control strategies in a manner that is compliant with law and this standard.

**SIM** is responsible to:

- Issue operational, calibrated and bump tested gas monitors to permit receivers upon request and maintain a record of this issuance.

**Construction Coordinators** are responsible to:

- Issue bump tested gas monitors within calibration date to capital permit receivers.
- Maintain a bump test log and record of issuance.

**Contractors** are responsible to:

- Train and verify competence of Permit Receivers, Supervisors, Entrants, and Watchmen / Attendants.
- Provide adequate supervision to ensure that hazards at the job site are properly identified and controlled.
- Make procedures and training records available for review by Suncor.
- Verify that all parties under their control follow the instructions of the safe work plan, permit instructions, and other procedures prescribed by Suncor and/or the Contracting company.
- Conduct continuous gas monitoring for Oxygen, LEL, H<sub>2</sub>S and CO at all confined space entries.

**Permit Receivers** are responsible to:

- Assume the duties and responsibilities of a supervisor as defined under the Ontario Occupational Health and Safety Act.
- Ensure familiarity with the precautions and equipment required to complete the task.
- Review the scope of work with the Permit Issuer to reach a mutual understanding of the work to be performed and how it will be accomplished including:
  - Any hazardous aspects of the task.
  - The equipment and area preparation.
  - The methods of isolation and lock-out.
  - The work crew size.
- Know, understand and comply with the precautions and provisions on the safe work permit. Sign the safe work permit as acknowledgement of this understanding.
- Provide a gas monitor to the Watchman for continuous gas monitoring of the confined space. Maintenance and Turnaround permit receivers will obtain the gas monitors from SIM. Capital permit receivers will obtain gas monitors from a Construction Coordinator or SIM.
- Review the scope of the job with the trades / craftsmen and have them sign the task analysis safety card (TASC).
- Prior to conducting any entries, the permit receiver must confirm that rescue resources are available on site.
- Communicate emergency procedures, location of safety equipment, and escape routes to the work crew.
- Post the safe work permit and CSE Assessment and Planning Form in a practical location at the work site.

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- Ensure that all work is being performed in accordance with safe work permit conditions, legal requirements, and Suncor and contractor standards.
- Ensure that all materials (tools, tubing, welding, machines, etc.) are removed from the job site before the job is signed off as complete or rendered safe.
- Ensure that the Permit Issuer is immediately informed should conditions and/or the scope of work change, when the job is complete, and the status of job when the safe work permit has expired.
- Ensure that the job site is rendered safe if the job is to be carried over.
- Return the Safe Work Permit, CSE Assessment and Planning Form and Watchman Log to the Permit Issuer for sign off.

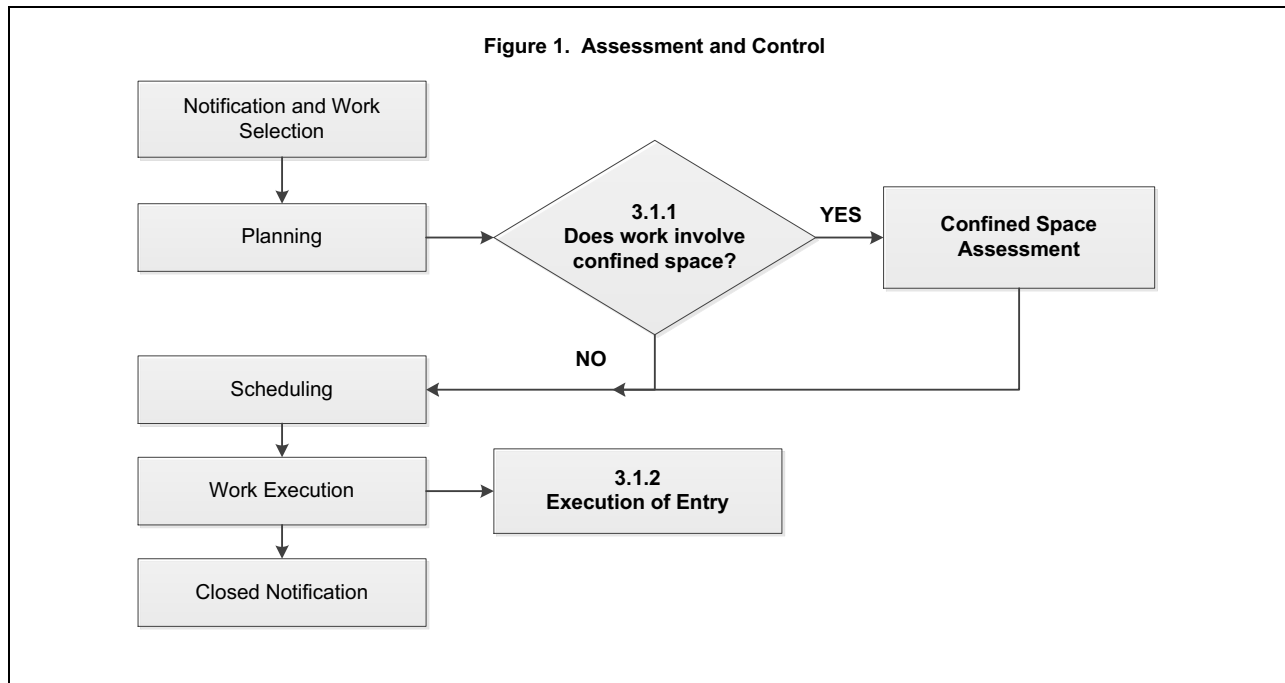
**Watchmen** are responsible to:

- Remain outside or near to the entrance of the confined space and maintain constant communication and/or visual contact with all workers in the confined space.
- Wear a reflective vest.
- Notify operations by radio in the event of an emergency.
- Record continuous gas monitor test results on the Watchman Log and ensure the gas monitor is returned at the end of the shift or when the job has been completed.
- Record each entrant's entry and exit.
- Place red danger tape and a tag or sign (atmospheres deemed unsafe) at the entry points before leaving the site unattended.

## **2.0 HAZARD ASSESSMENT**

### **2.1 Flow Chart**

The following flow chart illustrates the flow of activity and documentation involved in the identification, assessment and control of risk associated with entry into a confined space.



### **2.1.1 Identification and Assessment of Confined Spaces**

This standard applies to work that requires any person to enter a confined space or, due to proximity to openings, be directly exposed to hazards originating from the confined space. During the planning stages of all approved work, an initial assessment shall be made by the Planner to review scope and conditions of the proposed work and determine application of the requirements of this standard. The following are some examples of confined spaces at the Suncor Sarnia Refinery: tanks, vessels, towers, furnaces, hoppers, pits, column skirts, ventilation ducts, underground utility tunnels, pipelines, and catch basins, and sewer manholes. Hoarding may also restrict air movement and, under certain conditions, create a confined space hazard.

### **2.1.2 Confined Space Entry Assessment**

If any proposed work is to be conducted in a confined space within a process or tank farm area, the Planner shall work with the following to complete the Confined Space Entry (CSE) Assessment and Planning Form (Appendix A):

- Suncor Unit Operator
- Suncor Operations Maintenance Coordinator (or designate)
- Suncor Inspection Representative (if applicable)
- Contractor Representative competent in confined space entry
- Suncor Rescue Team Representative
- External Rescue Team Representative (if applicable)

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## **CONFINED SPACE ENTRY**

If any proposed work is to be conducted in a confined space outside a process or tank farm area, the Planner shall work with the following to complete the Confined Space Entry (CSE) Assessment and Planning Form:

- Area Owner Designate
- Suncor Inspection Representative (if applicable)
- Contractor Representative competent in confined space entry
- Suncor Rescue Team Representative
- External Rescue Team Representative (if applicable)

These consultations may be completed separately or included as part of one collective Pre-Job Meeting. Where appropriate, the Planner shall consult with the Suncor Safety Specialist or Occupational Hygienist and/or external technical resources for advice on methods for monitoring atmospheric hazards, specialized personal protective equipment, etc. The assessment / plan shall only apply to a specific and defined scope of work for a defined time as agreed to by all signatories. No CSE Assessment and Planning Form shall apply beyond 1 year of endorsement. In the case of large-scale projects, forms may be completed in advance of the work and signed by the appropriate parties. As execution approaches, the forms may be reviewed at the discretion of the OMC to verify that conditions expected during planning have not changed. If there is a need to have more than one worker from different employers in the same confined space at the same time, then an additional coordination section of the CSE Assessment and Planning Form shall be completed and signed by representatives of each employer. The Planning group shall keep a file of all CSE Assessments and Planning Forms for future reference, updating, and improvement. A copy of the signed CSE Assessment and Planning Form shall be provided to each signatory. The CSE Assessment and Planning Form is sent to Operations.

### **2.1.3 Execution**

All rescue team members shall be tracked by Security upon entry into the refinery. Prior to conducting any entries, the permit receiver must confirm that rescue resources are available on site. With the CSE Assessment and Planning Form complete and rescue team available, the general flow of work is summarized as follows:

- When satisfied with the work area conditions, the Permit Issuer signs onto the safe work permit.
- The Permit Issuer shall review the safe work permit and CSE Assessment and Planning Form with the Permit Receiver.
- The Operations Maintenance Coordinator (or designate) will sign onto the safe work permit as the next level permit issuer.
- The Permit Receiver must sign onto the permit before initiating the work.
- The Permit Receiver takes a copy of the signed CSE Assessment and Planning Form and Safe Work Permit to the field.

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- The Permit Receiver is responsible to review both the Safe Work Permit and CSE Assessment and Planning Form with all workers on the job and obtain their signatures on the TASC.
- The Permit Receiver is responsible to ensure that the Safe Work Permit and CSE Assessment and Planning Form are posted at the worksite in close proximity to the confined space entry. All precautions identified must be maintained. Upon completion of the work, the Safe Work Permit and Confined Space Entry Assessment and Planning Form and Watchman Log are returned to Operations and signed off by the Permit Issuer and Permit Receiver.

### **3.0 PRECAUTIONARY MEASURES**

#### **3.1 Safe Atmospheres**

For the purposes of confined space entries, a safe atmospheric level is defined as:

- Free of explosive levels of dusts, mists, or other agents.
- The atmospheric concentration of any explosive or flammable gas or vapour is:
  - less than 10% LEL for cold work.
  - 0% LEL for hot work.
- The oxygen content of the atmosphere is at least 19.5% but not more than 22% by volume.
- No potential for generation and accumulation of contaminants that could:
  - result in acute health effects that pose an immediate threat to life.
  - interfere with a person's ability to escape unaided from a confined space.



| <b>Table 1. Safe Atmosphere Precautions</b> |  |
|---|--|
| <b>CRITERIA</b>                             | <b>PRECAUTIONS</b>   |
| <b>Rescue Plan</b>                          | A rescue plan is required for all CSEs as part of the job package.   |
| <b>Safety Harness</b>                       | All persons entering the confined space must wear a safety harness. The requirement may be waived if it is not required in the rescue plan, restricts egress, or poses risk to worker(s).                  |
| <b>Watchman</b>                             | A vested Watchman shall be stationed outside or near to the entrance of the confined space and be in constant communication with the person entering the space. A radio shall be provided to the watchman. |
| <b>Electrical Equipment</b>                 | All efforts shall be made to avoid electrical connections inside the confined space. Intrinsically safe flashlights must be available in the case of a power failure.                                      |
| <b>Pneumatics</b>                           | All pneumatic tools used in a confined space shall be operated with uncontaminated air. Plant air shall not be used unless authorized by the Operations Manager.   |
| <b>PPE</b>                                  | PPE must be provided that will protect the entrant from potential health hazards   |
| <b>Cylinders</b>                            | Locate all compressed gas / oxygen cylinders and associated manifolds outside the confined space. Five-minute escape packs and SCBA are exempt from this requirement.                                      |
| <b>Air Monitoring</b>                       | Continuous monitoring required.  |

### **3.2 Atmospheres Not Deemed Safe**

In addition to all requirements listed in Table 1, the following are the minimum precautions required for all confined space entries into atmospheres not deemed to be safe:

| <b>Table 2. Atmospheres Not Deemed Safe</b> |  |
|---|--|
| <b>CRITERIA</b>                             | <b>PRECAUTIONS</b>   |
| <b>Safety Pause</b>                         | A safety pause shall be completed in following with Suncor procedure, for all entries into atmospheres not deemed safe.  |
| <b>Safety Harness</b>                       | All persons entering must wear a safety harness.   |
| <b>Safety Lifeline</b>                      | A safety lifeline must be securely fastened to the safety harness with the free end secured outside the confined space within quick access by the Watchman.  |
| <b>Breathing Apparatus</b>                  | Each person entering shall wear a supplied air full face respirator with a bottle watch. The Entrant shall also be equipped with a self-contained 5-minute reserve supply of air for emergency exit. |

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### **3.3 Signage And Postings**

Personnel assigned to opening confined spaces (e.g. remove access covers) shall place Danger Tape across the opening with a completed Confined Space Danger tag to warn against entry until proper permitting has occurred. Confined spaces where the atmosphere is not deemed safe shall be placarded with a sign containing the word "Danger" written in legible letters that are at least 150 millimetres in height and shall state "Confined Space Hazardous Atmosphere - Enter by Permit Only". These signs shall be maintained and made available through Operations in each of the control rooms.

### **3.4 Gas Testing**

All confined spaces will require continuous gas monitoring for Oxygen, LEL, H<sub>2</sub>S, and CO. Any additional testing for other substances shall be conducted as specified in the CSE Assessment and Planning Form.

Gas testing shall be conducted by a competent gas tester. Prior to initial entry into a confined space, a pre-entry gas test shall be conducted with the readings recorded directly onto the Suncor Safe Work Permit. The contractor is responsible to conduct continuous gas monitoring for Oxygen, LEL, H<sub>2</sub>S, and CO. Maintenance and TA permit receivers will obtain gas monitors from SIM. Capital permit receivers will obtain the gas monitors from a Construction Coordinator or SIM. Before the workers enter the confined space, the Watchman will place the gas monitor at the entry with the probe in the space. The Watchman is responsible for recording gas test results on the Watchman Log hourly and prior to re-entry whenever the space is unoccupied or unattended. Should the monitor alarm and/or exceed limits, the Watchman will remove all entrants and contact operations. Should the monitor malfunction, the Watchman will remove all entrants and have the Permit Receiver obtain a replacement from SIM or a Construction Coordinator as appropriate.

In the event it becomes impractical to continuously gas test the confined space due to constant clogging of the gas monitor's filter by excessive dust, the confined space shall be gas tested hourly and prior to re-entry whenever unoccupied and unattended with the results being recorded on the Watchman Log.

The testing of air within a confined space must be accurate and representative of the occupied space. Accuracy of the sample is established by ensuring that the equipment being used is operating correctly. The person evaluating the space shall understand where the work is to be conducted, the type of work, the potential sources of hazardous contaminants, and the flow of air through the space. The tester should also consider the behaviour of the contaminants being measured and the tendency for these contaminants to rise, fall or pocket in a confined space. Based on this, the person conducting the gas testing can place their measuring equipment in locations that are representative of realistic worst case exposures.

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### **3.5 Watchman**

A Watchman must be stationed outside or near to the entrance of the confined space and remain in constant communication and/or visual contact with all workers in the confined space. The Watchman is identified by a reflective vest. The Watchman shall not enter the confined space at any time. They may provide limited assistance to workers and be available to summon help if required. Before leaving for break, the Watchman will verify that all workers are out of the confined space and will log exits on the log sheet found in Appendix B. The Watchman is also responsible for recording the gas monitor test results on the log hourly and prior to re-entry whenever the confined space has been unoccupied or unattended. The Watchman will also place red danger tape and a tag or sign (for atmospheres deemed unsafe) at the entry points before leaving the site unattended. It is critical that the Supervisor ensure clarity of the responsibilities and reporting protocols of the Watchman in the event of an emergency.

### **3.6 Severe Weather**

There are some confined space entries where entry into the system may be put at significant risk with abnormal weather conditions. In the event of severe weather, the Sarnia Refinery Severe Weather Procedure shall be implemented.

### **3.7 Tools**

There are many different types of tools used in confined spaces. The following types of tools require special consideration:

- Electrical tools
  - If any electrical tools and equipment are used in a confined space, hot work permitting requirements apply.
  - If wet or damp conditions exist inside the space, all electrical tools shall be protected by an approved ground fault circuit interrupter.
- Only non-sparking tools (powered or otherwise) may be used in a confined space where the atmospheric concentration of any flammable or explosive gases, vapours or liquids is greater than 0% LEL.
- No gas cylinders are permitted in the confined space.
- Torches and hoses used for welding, brazing or cutting shall be removed from a confined space when not in use and when the confined space is vacated.

## **4.0 EMERGENCY PREPAREDNESS**

The CSE Assessment and Planning Form formally integrates rescue planning with entry planning. It effectively ensures that no person shall enter into a confined space unless appropriate consideration has been made for their rescue.

Depending on the complexity of the entry and rescue needs, the Rescue Team Representative may review previous rescue plans, visit the work location, review with Rescue Team members, and/or discuss the detailed scope of work with the Planner. During the planning of the work, CSE Assessment and Planning Form provides a general guideline for all personnel involved with the planning process to discuss and identify rescue needs for the entry.

A copy of the completed CSE Assessment and Planning Form is posted in the Fire Hall so that it is available to the rescue team in the event that response is required.

#### **4.1 Rescue Team Requirements**

The Suncor Sarnia Refinery maintains a full-time confined space entry rescue team that is available to the site during normal maintenance working hours. This team is trained to:

- Activate under refinery notification protocols.
- Respond under refinery incident command as required.
- Understand refinery-specific scenarios.
- Interface directly with municipal rescue responders.

When members of the team are not available (e.g. during off hours), a pre-qualified external rescue team shall be provided. If a pre-qualified external rescue team is used, the CSE Assessment and Planning form shall be reviewed and signed by the external rescue team lead.

The Emergency Response Specialist (or designate) is responsible to ensure that all rescue equipment available onsite for the day rescue team is inspected, readily available, and maintained in good working condition. External rescue service providers must inspect their own equipment and verify readiness as required by law.

#### **4.2 Emergency Rescue Notifications**

It is the responsibility of the permit receiver to review radio / notification protocols with their Watchman and Operations. Radios shall be provided by the CSE Watchman's employer and shall be set to the appropriate Operations channel. Prior to initial entry, the Watchman shall perform a radio check to Operations to verify operation of their radio. The entry shall only begin upon acknowledgement of radio communication.

**Declaration of Emergency** – In the event of an emergency, the *Use of Refinery Emergency Siren & Alert Notification Signal Standard* shall be followed.

## **5.0 INSTRUCTION AND TRAINING**

### **5.1 General Awareness**

During orientation, all new Suncor employees shall receive instruction and a General Rules Handbook containing basic information on protective clothing, signage, and other key safety concepts on the site. Precautions regarding confined space entry are referenced in the orientation including the need for specific training and competency for Entrants and Watchmen. Suncor personnel that are required to wear a respirator are required to be trained and fit tested. Auditable records of respirator fit testing are available through Suncor EHS. Contractors are provided with similar general site information as part of their orientation. Contractors are expected to provide additional training to their workers to ensure compliance with law, this standard, and awareness of risks pertaining to their specific scope of work at the refinery. All contractor training records and verification of fit testing shall be available from the contractor upon request by Suncor.

### **5.2 Entrants And Watchman**

Suncor employed Entrants and Watchmen shall be trained through the Suncor Refinery EHS group or external agency as approved by the EHS group. Operators, by their training, knowledge, skills and experience are considered qualified watchman. Records for this training shall be maintained through SAP. Contractors with employees involved in confined space entry work, shall establish auditable records for Suncor review that demonstrates how their workers have received training from a recognized training body to support their designation as competent workers.

### **5.3 Permit Issuer Training**

All Confined Space Entry Permit Issuers are required to complete confined space entry training through the Refinery EHS group or Industrial Education Coop. In addition to this training, all Permit Issuers shall be provided with an overview of the content of this standard.

### **5.4 Gas Tester Training**

All personnel required to perform initial testing of hazardous atmospheres, or required to monitor gas testing equipment, must be trained in gas testing procedures, safe limits of measurements, and knowledge of the equipment operation.

## **5.5 Suncor Supervisors & Planners Training**

All Suncor employees working in a line supervisory role, as a planner, or as a confined space entry responder are required to complete confined space entry training through the Refinery EHS group or Industrial Education Co-op.

## **5.6 Suncor Rescue Team**

Detailed training requirements for the Suncor Rescue Team are provided in the Emergency Organization Manual. The Suncor Rescue Team is required to conduct at least one confined space entry practice drill on site each year.

## **6.0 AUDITING**

### **6.1 Standard Audit**

The Suncor EHS Manager is responsible to ensure that this standard is audited against legal and industry best practice annually. This audit shall include review of documentation, records, interviews, and other verification of adherence to this standard by all parties involved with the planning and execution of work. The Joint Health and Safety Committee (JHSC) shall be invited to either participate directly in this audit or review audit findings. A copy of the audit report and work plan required to address identified gaps shall be made available to the JHSC.

## **7.0 RECORDS**

### **7.1 General**

Confined space entry records shall be maintained in accordance with safe work permit record keeping requirements.

## **8.0 EXCEPTIONS**

Any deviation to this standard requires approval through the Suncor Management of Change process.

## **9.0 DEFINITIONS:**

The following are definitions of words used in this standard and as referenced in law.

**Active Ventilation** - includes the movement of fresh air into a space through the use of an energy source.

**Atmospheric Hazards** - means,

- the accumulation of flammable, combustible or explosive agents,
- an oxygen content in the atmosphere that is less than 19.5 per cent or more than 22 per cent by volume, or
- the accumulation of atmospheric contaminants, including gases, vapours, fumes, dusts or mists, that could,
  - result in acute health effects that pose an immediate threat to life, or
  - interfere with a person's ability to escape unaided from a confined space.

**Competent Worker** - in relation to specific work, means a worker who,

- is qualified because of knowledge, training and experience to perform the work,
- is familiar with the Act and with the provisions of the regulations that apply to the work, and
- has knowledge of all potential or actual danger to health or safety in the work.

**Confined Space** - means a fully or partially enclosed space,

- that is not both designed and constructed for continuous human occupancy, and
- in which atmospheric hazards may occur because of its construction, location or contents

or because of work that is done in it.

**Employer** - means a person who employs one or more workers or contracts for the services of one or more workers and includes a contractor or subcontractor who performs work or supplies services and a contractor or subcontractor who undertakes with an owner, constructor, contractor or subcontractor to perform work or supply services.

**Inerting** - means purging with inert gas.

**Inhibited Access** - means that access into the confined space restricts easy entry.

**Inhibited Egress** - means that egress from the confined space restricts easy exit.

**Passive Ventilation** - includes the movement of fresh air into a space through the use of natural air movement.

**Purging** - means displacing contaminants from a confined space.

**Sample** - means an individual reading of the composition of the atmosphere in the confined

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space.

**Supervisor** - means a person who has charge of a workplace or authority over a worker.

**Test** - means a collection of samples.

**Watchman** - means a Safety Watch or Attendant as referred to in law.

#### 10.0 REFERENCES TO RELATED DOCUMENTS

- [Use of Refinery Emergency Siren & Alert Notification Signal](#)
- [Safe Work Permit Standard](#)
- [Life Saving Rules Standard](#)
- [Severe Weather Procedure](#)

**END OF STANDARD**





**REVISION LOG**

| <b>Date</b> | <b>Revision</b> | <b>Section</b> | <b>Comment</b>  |
|-------------|-----------------|----------------|---|
| 05/01/2006  | 0               |                | Original issue of Sarnia Refinery Confined Space Entry Standard. Replaces previous documents OI 1.035 (Confined Space Application and Assessment); SO 2.017 (Preparation of a Confined Space); Accident Prevention Manual section 25 (Regulatory reference, special entry guidelines); OI 1.024 Entry into Tanks; OI 1.009 Radio Requirements |
| 09/01/2006  | 1               | All            | Editorial changes and additional explanations to ensure clarity based on comments and questions received from refinery users following initial roll-out.  |
| 08/16/2010  | 2               | All            | Standard revised to add new continuous gas monitoring requirements and to incorporate proposed changes submitted by impacted stakeholders.  |
| 08/19/2010  | 3               | 3.4            | Continuous Gas Monitors will be provided by Suncor. Paragraph added to address protocol when continuous monitor filters clog.   |
| 08/19/2010  | 3               | 4.2            | Declaration of Emergency protocol changed to reference Use of Refinery Emergency Siren & Alert Notification Signal Standard.  |
| 06/08/2012  | 4               | 1.0            | Contractor Responsibility Section – Removed requirement for contractors to provide and maintain continuous gas monitors, bump stations and all associated training.   |
| -           | -               | Appendix A     | Confined Space Assessment and Planning Form – Rescue Response Equipment Section. Removed FT 6 Response Vehicle and Rescue Equipment Trailer. Replaced with Rescue / Command Vehicle.  |

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|            |   |            |   |
|------------|---|------------|---|
| 07/10/2012 | 5 | All        | Updated format & index, but content was NOT altered.  |
| 09/21/2012 | 6 | 1          | Permit Receiver Responsibility Section – Permit Receivers will obtain gas monitors from SIM instead of Permit Issuer.   |
| -          | - | 3.4        | Permit Issuer will ensure Permit Receiver has a properly functioning gas monitor to continuously monitor the space.   |
| 10/23/2012 | 7 | 1          | Added SIM responsibility to Issue operational, calibrated and bump tested gas monitors upon request and maintain a record of this issuance. (D.Allen)   |
| -          | - | 1          | Added Construction Coordinator responsibility to issue bump tested gas monitors within calibration date to Capital permit receivers and to maintain a bump test log and record of issuance. (D.Allen)   |
| -          | - | 1          | Clarified Permit Receiver Responsibility regarding obtaining gas monitors. Maintenance and TA permit receivers will obtain gas monitors from SIM. Capital permit Receivers will obtain gas monitors from a Construction Coordinator or SIM. (D.Allen) |
| -          | - | 3.4        | Remove requirement for Permit Issuer to ensure Permit Receiver has a properly functioning gas monitor to continuously monitor the space and record the identification number on the associated safe work permit. (D.Allen)                            |
| -          | - | All        | Format cleanup (J. Boilard)   |
| 07/24/2013 | - | Header     | Document Owner & Contact Updated, but NO content changed. (L. Lebert)   |
| 07/20/2015 | - | Header     | Document Contact Update – Safety Advisor  |
| 04/22/2019 | - | Assessment | Type of CS entry added to the CSE planning form top section to help better understand what type of entry we are making  |
| 04/22/2019 | - | Assessment | Updated Pyrophoric section. Pyrophorics now has its own section for assessment  |

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**CONFINED SPACE ENTRY**

Current versions of approved documents are maintained in Livelink. Printed copies are uncontrolled.

|            |   |            |   |
|------------|---|------------|---|
| 04/22/2019 | - | Assessment | Added Inert entry section to the planning form and added Appendix C and C-A to the CSE Standard |
|------------|---|------------|---|

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**CONFINED SPACE ENTRY**

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**APPENDIX A**  
**Confined Space Assessment and Planning Form**



**CONFINED SPACE ASSESSMENT & PLANNING FORM**  
**(ADDENDUM TO SAFE WORK PERMIT)**

**CONFINED SPACE ENTRY**

|                     |   |   |   |
|---------------------|---|---|---|
| Date of Assessment: | Date of Expiration:                         |   |   |
| Planner:            | Employer / Contractor:                      | OMC / Designate:                              |   |
| Location of Entry:  |   |   |   |
| Type of CS entry    | Safe Atmosphere<br><input type="checkbox"/> | Unsafe Atmosphere<br><input type="checkbox"/> | Inert Entry<br><input type="checkbox"/> |

Description of Work:

| <b>GENERAL</b>   | <b>YES</b> | <b>NO</b> |
|--|------------|-----------|
| Contractor Control Program requirements met?   |            |           |
| Contractor has submitted their Confined Space Entry Program to Suncor EHS?             |            |           |
| Contractor has verified fit testing / training for entrants, Watchman and supervisors? |            |           |

| <b>ACTIVITY</b>   | <b>REQUIRED?</b>    | <b>YES</b> | <b>NO</b> | <b>N/A</b> | <b>ADDITIONAL NOTES</b> |
|-------------------|---------------------|------------|-----------|------------|-------------------------|
| Initial Area Prep | Depressure/draining |            |           |            |                         |
|                   | Steaming            |            |           |            |                         |
|                   | Water flush         |            |           |            |                         |
|                   | Inert gas purge     |            |           |            |                         |
|                   | Non-inert gas purge |            |           |            |                         |
|                   | Near sewers covered |            |           |            |                         |
|                   | Other               |            |           |            |                         |

|             |                |  |  |  |  |
|-------------|----------------|--|--|--|--|
| Inert entry | Nitrogen Purge |  |  |  | If checked YES:<br>The N2 supply must be protected from inadvertent shut off or use in other purposes. |
|-------------|----------------|--|--|--|--|

***Primary Nitrogen supply shall be dedicated and reliable. The preferred primary supply shall be connected directly to a nitrogen supply header at the vessel. Nitrogen primary supply pressure shall be recorded. Entry is only allowed when using Primary Source. A secure back-up supply of nitrogen shall be provided to allow the vessel to be evacuated and made safe in the event of loss of the primary supply.***

**EMERGENCY EVACUATION NITROGEN DAILY CHECKLIST**

|   |  |  |  |  |
|---|--|--|--|--|
| Pre Vessel Entry (To be completed prior to initial entry) |  |  |  | If checked yes please refer to Appendix C for completion   |
| Maintenance Execution Inert Entry (Once per shift)        |  |  |  | If checked yes please refer to Appendix C-A for completion |

|                                    |   |                                  |           |            |                         |
|------------------------------------|---|----------------------------------|-----------|------------|-------------------------|
| Signage and Postings               | DANGER signage  |                                  |           |            |                         |
|                                    | Permit, Assessment and Watchman Log   |                                  |           |            |                         |
|                                    | Other   |                                  |           |            |                         |
| Ventilation                        | Passive ventilation   |                                  |           |            |                         |
|                                    | Active ventilation  |                                  |           |            |                         |
|                                    | Local exhaust   |                                  |           |            |                         |
|                                    | Other   |                                  |           |            |                         |
| Initial and Continuous Gas Testing | Oxygen  |                                  |           |            |                         |
|                                    | LEL   |                                  |           |            |                         |
|                                    | CO  |                                  |           |            |                         |
|                                    | Hydrogen Sulphide   |                                  |           |            |                         |
| Initial and Periodic Gas Testing   | VOCs  |                                  |           |            |                         |
|                                    | Aromatics   |                                  |           |            |                         |
|                                    | Hydrogen Flouride   |                                  |           |            |                         |
|                                    | Other   |                                  |           |            |                         |
| <b>ACTIVITY</b>                    | <b>REQUIRED?</b>  | <b>YES</b>                       | <b>NO</b> | <b>N/A</b> | <b>ADDITIONAL NOTES</b> |
| Isolation                          | Blanking  |                                  |           |            |                         |
|                                    | Dbl Block and Bleed   |                                  |           |            |                         |
|                                    | Mechanical lock-out   |                                  |           |            |                         |
|                                    | Electrical lock-out   |                                  |           |            |                         |
|                                    | Radiation lock-out  |                                  |           |            |                         |
|                                    | Other   |                                  |           |            |                         |
| Fire Prevention & Protection       | Fire extinguisher   |                                  |           |            |                         |
|                                    | Combustibles  |                                  |           |            |                         |
|                                    | Other   |                                  |           |            |                         |
| Pyrophoric                         | Does this equipment process material have the potential to produce pyrophoric residual in this equipment? |                                  |           |            |                         |
|                                    | Will equipment be Chemically treated for pyrophoric?  |                                  |           |            |                         |
|                                    | Will any Scale need to be mechanically cleaned exposing pyrophorics?                                      |                                  |           |            |                         |
|                                    | What controls need to be in place to manage the potential pyrophoric risk?                                | <b>Please list the controls:</b> |           |            |                         |
| Access / Egress                    | Inhibited access  |                                  |           |            |                         |
|                                    | Inhibited egress  |                                  |           |            |                         |
|                                    | Tripod for top entry  |                                  |           |            |                         |

|     |                      |  |  |  |  |
|-----|----------------------|--|--|--|--|
|     | Other                |  |  |  |  |
| PPE | Cartridge Respirator |  |  |  |  |
|     | SCBA                 |  |  |  |  |
|     | Supplied Air         |  |  |  |  |
|     | Fall Protection      |  |  |  |  |
|     | Special Coveralls    |  |  |  |  |
|     | Safety Harness       |  |  |  |  |
|     | Retrieval Harness    |  |  |  |  |
|     | Anklets              |  |  |  |  |
|     | Lifeline             |  |  |  |  |
|     | Other                |  |  |  |  |

**Page 1 of 5**

|                     |  |  |  |  |  |
|---------------------|--|--|--|--|--|
| Tools               | Intrinsically Safe                           |  |  |  |  |
|                     | Air for pneumatics                           |  |  |  |  |
|                     | Grounding                                    |  |  |  |  |
|                     | Other  |  |  |  |  |
| Watchman            | Competency Verified                          |  |  |  |  |
|                     | Radio Required                               |  |  |  |  |
|                     | Other  |  |  |  |  |
| Other Hazards       | Temperature Stress                           |  |  |  |  |
|                     | Vibration                                    |  |  |  |  |
|                     | Noise  |  |  |  |  |
|                     | Lighting                                     |  |  |  |  |
|                     | Other  |  |  |  |  |
| External Assistance | Specialists required to review decision/plan |  |  |  |  |

**Page 2 of 5**

**COORDINATION CONSIDERATIONS BY LAW IF > 1 EMPLOYER INVOLVED PER ENTRY**

|                                | YES | NO | N/A |                                 | YES | NO | N/A |
|--------------------------------|-----|----|-----|---------------------------------|-----|----|-----|
| CSE programs submitted?        |     |    |     | Communication reviewed?         |     |    |     |
| CSE procedures verified?       |     |    |     | PPE established / available?    |     |    |     |
| Worker competency verified?    |     |    |     | Additional isolation?           |     |    |     |
| Special rescue needs required? |     |    |     | Additional ventilation/purging? |     |    |     |

Any other work co-ordination issues / controls required due to coordination of work in the confined space?

**Representatives from each employer/contractor name & signature here including company representing**

**EMERGENCY PREPAREDNESS**

| EMERGENCY PREPAREDNESS   | YES | NO | N/A | COMMENT / NOTES |
|--|-----|----|-----|-----------------|
| Is the Suncor Rescue Team available during work activity?              |     |    |     |                 |
| Is an external rescue team required?<br>Contact Info:                  |     |    |     |                 |
| Special instruction for coordinating with municipal rescue responders? |     |    |     |                 |
| PPE requirements clear for the rescuers and available?                 |     |    |     |                 |
| Entry drawing attached?  |     |    |     |                 |
| Response route established and available to rescue team?               |     |    |     |                 |

General Preparedness Comments:

**EMERGENCY RESPONSE**

**1. Rescue Response Equipment**

- Rescue / Command Vehicle
- BA – Back Paks
- BA – Air Cart
- BA – Set up required at entry

Comments

**2. Description of Confined Space**

- Vertical
- Horizontal
- Tank
- Tower
- Vessel
- Vault
- Excavation
- Other

|  |  |
|--|--|
| <b>3. Access</b>   |  |
| <input type="radio"/> Top  |  |
| <input type="radio"/> Bottom   |  |
| <input type="radio"/> Side   |  |
| <input type="radio"/> Round  |  |
| <input type="radio"/> Square   |  |
| <input type="radio"/> Other  |  |
| Portal Size and Comments   |  |
| <b>4. Obstructions to Rescuers</b>   |  |
| <input type="radio"/> Piping   |  |
| <input type="radio"/> Trays  |  |
| <input type="radio"/> Compartments   |  |
| <input type="radio"/> Manway Size  |  |
| <input type="radio"/> Cramped Area   |  |
| <input type="radio"/> Other  |  |
| Comments   |  |
| <b>5. Rescue Hauling System</b>  |  |
| <input type="radio"/> No Rope Required   |  |
| <input type="radio"/> Block and Tackle   |  |
| <input type="radio"/> Z-Rig  |  |
| <input type="radio"/> Lowering System Required   |  |
| Comments   |  |
| <b>6. Anchor Points / Accessories</b>  |  |
| <input type="radio"/> Anchor easily accessible   |  |
| <input type="radio"/> Ladder available to reach anchor point                           |  |
| <input type="radio"/> Anchor point required to be installed                            |  |
| <input type="radio"/> No anchor required   |  |
| <input type="radio"/> Tripod required  |  |
| <input type="radio"/> Crane as anchor point  |  |
| <input type="radio"/> Travel platform available  |  |
| Comments   |  |
| <b>7. Minimum number of rescuers and any special skills to execute the rescue plan</b> |  |
| Comments   |  |
| <b>Page 4 of 5</b>   |  |



**ASSESSMENT / PLAN SIGNATURES****Planner / Coordinator**

|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**OMC or Designate**

|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**Unit Operator**

|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**Contractor**

|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**Contractor**

|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**Contractor**

|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**Rescue Team Representative**

|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**External Rescue Team Representative (If Applicable)\***


|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**Inspection Representative (If Applicable)**

|       |                  |
|-------|------------------|
| Name: | Contact Phone #: |
| Date: | Signature        |

**Note: In the event the confined space entry will require external rescue services, the Maintenance Supervisor (or Construction Coordinator for Capital Work) is responsible for ensuring the rescue plan is reviewed and signed by the External Rescue Team Representative.**

**APPENDIX B  
Watchman Log**

|  |                     |                |                 |                      |                 |                |                 |                    |                 |
|--|---------------------|----------------|-----------------|----------------------|-----------------|----------------|-----------------|--------------------|-----------------|
|   | <b>WATCHMAN LOG</b> |                |                 |                      |                 |                |                 |                    |                 |
| <b>CONFINED SPACE ENTRY</b>  |                     |                |                 |                      |                 |                |                 | Sheet ____ of ____ |                 |
| Date:  |                     |                |                 | Supervisor:          |                 |                |                 |                    |                 |
| Watchman Name:   |                     |                |                 | Contractor/Employer: |                 |                |                 |                    |                 |
| Location of Work:  |                     |                |                 |                      |                 |                |                 |                    |                 |
| Description of Work:   |                     |                |                 |                      |                 |                |                 |                    |                 |
| Entrant  |                     | Entrant        |                 | Entrant              |                 | Entrant        |                 | Entrant            |                 |
| Employer   |                     | Employer       |                 | Employer             |                 | Employer       |                 | Employer           |                 |
| <b>Time In</b>   | <b>Time Out</b>     | <b>Time In</b> | <b>Time Out</b> | <b>Time In</b>       | <b>Time Out</b> | <b>Time In</b> | <b>Time Out</b> | <b>Time In</b>     | <b>Time Out</b> |
|  |                     |                |                 |                      |                 |                |                 |                    |                 |
|  |                     |                |                 |                      |                 |                |                 |                    |                 |
|  |                     |                |                 |                      |                 |                |                 |                    |                 |
|  |                     |                |                 |                      |                 |                |                 |                    |                 |
|  |                     |                |                 |                      |                 |                |                 |                    |                 |
| <b>WATCHMAN SIGNATURE</b>  |                     |                | NOTES           |                      |                 |                |                 |                    |                 |
| Date:  |                     |                |                 |                      |                 |                |                 |                    |                 |
| <p><b>IMPORTANT: CONFINED SPACE ASSESSMENT AND PLANNING FORM AND WATCHMAN LOG MUST ACCOMPANY THE SIGNED WORK PERMIT AT ALL TIMES. WATCHMAN IS REQUIRED TO RECORD GAS TEST RESULTS HOURLY AND PRIOR TO RE-ENTRY WHENEVER THE CONFINED SPACE HAS BEEN UNOCCUPIED OR UNATTENDED. THESE FORMS ARE TO BE RETURNED TO THE PERMIT ISSUER UPON COMPLETION OF THE WORK.</b></p> |                     |                |                 |                      |                 |                |                 |                    |                 |



APPENDIX C  
EMERGENCY EVACUATION NITROGEN DAILY CHECKLIST

| PLANT | UNIT | SYSTEM | DATE | SHIFT |
|-------|------|--------|------|-------|
|       |      |        |      |       |

| Pre Vessel Entry (To be completed prior to initial entry) |         |         |          |          |
|---|---------|---------|----------|----------|
|   | YES     | NO      | COMMENTS | INITIALS |
| Emergency Evacuation Nitrogen System in Place             |         |         |          |          |
| Type of system being used – Bottles / Trailer             | BOTTLES | TRAILER |          |          |
|   | YES     | NO      | COMMENTS |          |
| Included in work plan                                     |         |         |          |          |
| Identified on vessel entry CSE Assessment                 |         |         |          |          |
| Does Contractor Have Evacuation Procedure                 |         |         |          |          |
| Pressure  |         |         |          |          |

**CHECK LIST COMPLETED BY OPS, TA COORDINATOR OR DESIGNATE:**

|                            |  |                  |  |
|----------------------------|--|------------------|--|
| <b>NAME</b> (PLEASE PRINT) |  | <b>SIGNATURE</b> |  |
|----------------------------|--|------------------|--|

APPENDIX C - A  
**EMERGENCY EVACUATION NITROGEN DAILY CHECKLIST**

| <b>Maintenance Execution Inert Entry (Once per shift)</b>   |     |    |          |          |
|---|-----|----|----------|----------|
|   | Yes | No | Initials | Comments |
| Emergency Evacuation Nitrogen System in Place and Connected   |     |    |          |          |
| Permit Issuer Familiar with Emergency Evacuation Procedure  |     |    |          |          |
| Permit Receiver clear on Emergency Evacuation Nitrogen addition Valve Location  |     |    |          |          |
| Have all locations where N2 is venting to atmosphere been appropriately signed and flagged?                                   |     |    |          |          |
| Has Catalyst Contractor restricted entry to the reactor structure via use of signage and flagging?                            |     |    |          |          |
| Is the Catalyst Contractor confined space entry monitoring trailer manned, with video and temperature indication functioning? |     |    |          |          |
| Does the Catalyst Contractor attendant have a radio tuned to the correct Operations channel?                                  |     |    |          |          |
| Is the gas detection log available and current?   |     |    |          |          |
| Pressure  |     |    |          |          |

**CHECK LIST COMPLETED BY OPS, TA COORDINATOR OR DESIGNATE:**

|                            |  |                  |  |
|----------------------------|--|------------------|--|
| <b>NAME</b> (PLEASE PRINT) |  | <b>SIGNATURE</b> |  |
|----------------------------|--|------------------|--|



The following individuals have approved and signed this document.

UserName: Todd Murray (toddmurray)

Title: Mgr EH&S Sarnia Refinery

Date: Thursday, 24 October 2019, 02:48 PM Mountain Time

Meaning:

=====