Review & Discussion ANSI / ASSE Z117.1-2009
Safety Requirements For Confined Spaces

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Mission: Delivering world class safety & health services.


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Supports:

- Community (i.e. School Bus Safety)
- Road:
  - New Drivers’ Education Program
  - Defensive Driving Training
  - Motorcycle & Scooter
- Occupational Health & Safety
  - Training
  - Consulting
  - Audits
  - Certificate of Recognition Program
  - First Aid Courses
  - Annual Safety Conference (March 24 – 26, 2010)
The goal of this session:

- Provide General Discussion Points Surrounding Confined Spaces.
- Identify Elements to ANSI Standard
- Can the ANSI Standard Assist Company Programs?
- Where’s Canada Standard?

CSA: (April 2010)
Legislated Requirements for Confined Space Program

*Canada Labour Code – Part II / NS General Regulation*

1. Inventory List
2. Hazard Assessment
3. Written Program – 9 Elements (NS Gen. Regs. Part 12)
   - Assessment / Permit
   - Training
   - Notice Process for Work
   • Emergency Procedures
   • PPE / Emergency Equipment For
What Makes A Space To Be Classified As A Confined Space?

Canada Labour Code – Part II
NS General Regulation

1. Enclosed or partially enclosed space
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Logic Diagram For Confined Space Entry
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ANSI Standard for Confined Space Program

1. Confined Space Survey / Inventory
2. Hazard Identification and Evaluation
3. Confined Space Classification
4. Written Program (12 Elements)
   - Atmospheric Testing
   - Entry Team
   - Isolation and Lockout / Tagout
   - Auxiliary Equipment
   - Warning Signs and Symbols
   - Emergency Response, Evacuation, and Rescue
   - Training
   - Medical Suitability
   - Contractors
What Makes A Space To Be Classified As A Confined Space?

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Confined Space. Enclosed area large enough and configured to allow a person to bodily enter and has the following characteristics:

- Its primary function is other than human occupancy.
What Makes A Space To Be Classified As A Confined Space?

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Confined Space. Confined spaces can become unsafe as a result of:

1) possible atmospheric contamination by toxic or flammable vapors, or oxygen deficiency or excess;
2) possible physical hazards;
3) the possibility of liquids, gases, or solids being introduced to the space.
Hazard Identification and Evaluation

Confined spaces shall be considered hazardous until determined to be otherwise. Hazards shall be identified for each confined space prior to entry. The hazard identification process shall be conducted by a qualified person and include, but not be limited to, a review of the following:

- past and current uses of the confined space which may adversely affect the atmosphere of the confined space.
- physical characteristics, configuration, and location of the confined space.
- Existing or potential atmospheric hazards.
Hazard Identification and Evaluation

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

- Scope of hazard exposure.
- Magnitude of the hazard.
- Likelihood of hazard occurrence.
- Consequences of the hazard occurrence.
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Non-Permit Confined Space (NPCS).

A space, which, by configuration, meets the definition of a confined space but which, after evaluation is unlikely to have potential hazards or has the hazards eliminated by engineering controls.
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Non-Permit Confined Space (NPCS).

• **Controls.** Sections 7 through 17 of this standard shall be considered for NPCS entries to determine their relevance for safe entry.

• **Training.** *Initial and follow-up* training shall be conducted as needed to maintain competence in entry procedures and precautions.

• **Re-Evaluation.** *NPCS's shall be* periodically re-evaluated to assure proper classification.
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Permit Required Confined Space (PRCS).

A confined space, which after evaluation, is found to contain actual or potential serious hazards. Because of the severity of the hazards, the confined space requires written authorization for entry.
Permit Required Confined Space (PRCS).

Entry Permits. A permit shall be established for all PRCS entries. This document shall include:

• The date, location, names or identification of entrants and type of work which will be conducted in the confined space.
• The hazards to be controlled / eliminated prior to proceeding with entry.
• Safety equipment & precautions required to perform the job.
• The identification of the test instrument, the type of atmospheric tests required, and the results of those tests.
• The type of equipment which will be necessary for a rescue and how aid will be summoned in the event of an emergency.

Permit Implementation. Before each entry, permit signed by a qualified person and the contents communicated to the entrants, or posted, or both.
Entry Team - Attendant

• Location
  – shall be stationed immediately outside the point of entry/exit to observe the PRCS and be able to communicate with the occupants.

• Personnel Requirements
  – number of attendants needed shall be determined by a qualified person who shall consider the manpower necessary to carry out duties.

• Duties
  – Provide standby assistance to entrants entering the confined space
  – Direct entrants to exit when any irregularities are observed
Entry Team – Entrant

Duties

• Recognize potential hazards that may be encountered during the entry and proper use and limitations of equipment for control of these hazards. Inspect for hazards not identified by atmospheric monitoring during entry activities.

• Respond to emergencies, which includes method(s) for self-rescue or evacuation.

• Recognize symptoms and warning signs of exposure to potential hazards or prohibited conditions.

• Notify the attendant of any symptoms of exposure, emergency, or unacceptable condition in the confined space.
Entry Team – Entry Supervisor/Leader

Duties

• Know the requirements of the confined space entry program, including proper execution of duties of entrants, attendants and rescue personnel.
• Verify that all required actions have been taken prior to endorsing the permit and allowing entry to begin, and ensure that acceptable conditions are maintained for the duration of the entry.
• Verify that rescue services are available prior to and throughout the entry and that the means for summoning them are operable.
• Communicate the status and requirements of the entry to other Entry Supervisor/Leaders whenever the Entry Supervisor/Leader is changed.
• Terminate entry, assure removal of personnel and equipment, and revoke or cancel the permit when required.
Isolation & Lockout / Tagout

- All energy sources which are potentially hazardous to confined space entrants shall be secured, relieved, disconnected and/or restrained before personnel are permitted to enter the confined space.

- Energy sources may include electrical, mechanical, hydraulic, pneumatic (air), chemical, thermal, radioactive, and the effects of gravity.

- Lockout/Tagout. Machines, equipment, or processes shall be locked or tagged or both per ANSI/ASSE Z244.1, Control of Hazardous Energy - Lockout/Tagout and Alternative Methods.
Ventilation

- Atmospheric testing shall be done in accordance with Section 6 of the standard.
- Consideration should be given to the volume of the space to be ventilated, the output capacity of the ventilating device, and the distribution of air within the confined space.
- Ventilation normally consists of a pre-entry purge of several air changes, then continuous introduction of fresh air during occupancy.
- Natural ventilation may be acceptable if it can achieve the same results as the mechanical ventilation.
Cleaning / Decontamination

- Confined spaces shall be cleaned and decontaminated of hazardous materials as the preferred method of eliminating or reducing exposure and shall be done to the extent feasible before entry.
- In some instances, the purpose of the entry is to clean the confined space. In these cases, it should be cleaned and decontaminated as much as possible before personnel enter.
- Run off and decontamination should be disposed of per appropriate standards.
Personal Protective Equipment (PPE)

• A qualified person shall determine personal protective equipment needed by all personnel entering the confined space including rescue teams.
  – A hazard evaluation should be done to determine what PPE should be used. Combinations of equipment such as respirators, full suits, etc., may be needed.
• Employees shall wear personal protective equipment selected in accordance with the requirements of the job to be performed. PPE shall meet the specifications of applicable standards and regulations. PPE that will not exacerbate present
Auxiliary Equipment

- **Entry and Exit.** Each entry and exit point shall be evaluated to determine the most effective methods and equipment enabling to safely enter / exit.

- **Retrieval Equipment.** Appropriate retrieval equipment or methods shall be used whenever a person enters a PRCS. If the equipment increases the overall risks of entry / doesn’t contribute to the rescue, it shall not be used.

- **Fall Protection.** Where a potential exists for persons or objects falling into a confined space, warning systems, barricades, or other appropriate methods shall be utilized.
  
  – While protection is desired to prevent attendants or others from falling into a
Warning Signs and Symbols

• All permit required confined space openings that can be entered without the use of tools, special equipment, or key(s) shall have a sign identifying it as a permit required confined space.
• Signs shall be maintained in a legible condition.
• Sign shall include the wording "Danger-Permit Required Confined Space".
  – For more information refer to the ANSI/NEMA Z535 Standards for safety signs, symbols, and colors.
Emergency Response, Evacuation/Rescue

Emergency Response Plan
A plan shall be written and include:
1) Evacuation when certain hazards are identified during an entry.
2) Retrieval by trained crew members using non-entry methods.
3) Rescue entry by trained emergency response personnel familiar with confined space hazards as well as rescue procedures and equipment.

Determination of what type of rescue may be necessary to assist entrants.
• Horizontal Retrieval or Rescue.
• Vertical Retrieval or Rescue.

This rescue methodology shall include the use of fall protection for the entrant as well as suspended rescuers.
• Atmospheric Monitoring.
• Respiratory Protection Equipment.
• Rescue Equipment Inspection

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Training

For general requirements regarding training, refer to ANSI/ASSE Z490.1 Accepted Practices in Safety, Health, and Environmental Training.

Personnel responsible for supervising, planning, entering or participating in confined space entry and rescue shall be adequately trained in their functional duties prior to any confined space entry.

Training shall include:

- General hazards associated with confined spaces.
- Specific hazards associated with the confined space to be encountered.
- The hazard for which the PPE was selected, and the proper use, inspection, care,
Training

Training shall include:

• Duties and responsibilities as a member of the confined space entry team
• how to recognize probable air contaminant overexposure symptoms to
  themselves and co-workers, and method(s) for alerting attendants.
• Supplemental training, information, or a briefing is required to maintain
  competency when there are changes in procedures or equipment.
• Training for Atmospheric Monitoring Personnel.
Training

Training for Attendants and shall include the following:

• Duties, responsibilities and procedures for both routine and emergency operations.
• Hazards that may be encountered by entrants and the signs and symptoms of overexposure.
• Procedures for summoning rescue or other emergency services.
• The proper use of equipment used for communicating with entry and emergency/rescue personnel.
• Performance of non-entry retrievals.
Training

Training for Emergency Response Personnel. (Guidance as to qualifications and training requirements for rescue providers may be found in NFPA 1670, Standard on Operations and Training for Technical Rescue Incidents and NFPA 1006, Standard for Rescue Technician Professional Qualifications). **Shall include:**

- The rescue plan and procedures developed for each type of confined space the entry team can encounter.
- The rescue team shall achieve proficiency for each type of confined space they may encounter.
- Use of emergency rescue equipment.
Training

Verification of Training.

- Periodic assessment of the effectiveness of employee training shall be conducted by a qualified person.
  - Training effectiveness may be evaluated by several techniques. Written, as well as practical testing is recommended. Personnel should be questioned or asked to demonstrate their practical knowledge of confined space hazards that are in their work areas; to identify locations of confined spaces; their role in exercising proper permit procedures; use and donning of personal protective equipment such as respirators; and their role in response to
Training

Verification of Training.

• Training sessions shall be repeated as often as necessary to maintain an acceptable level of personnel competence.
  – Personnel who are routinely entering the same confined space on a daily basis will require less refresher training than employees who only occasionally enter a confined space.

• Written records of training shall be maintained and include as a minimum:
  – Employee’s name.
  – Trainer’s name.
  – Date(s) of training.
  – Training duration.
  – Training content.
Medical Suitability

The physical and psychological suitability of persons to adequately perform required duties of confined space work shall be considered as needed prior to working in confined spaces.

- Work in confined spaces may involve a variety of stressors which should be evaluated by a physician or other licensed Health Care Professional (HCP) against an essential job function based job description specific to the confined space.

- The confined space employer should make the final decision regarding medical suitability after reviewing recommendations and input after reviewing the HCP's recommendations and input.
Contractors

**Hazard Appraisal.** When an employer contracts work that involves confined space entry, the employer shall inform the contractor about the confined space including:

- The classification of the space (e.g., permit or non-permit).
- Hazards and operations within or near the space.
- The employer’s experience with the space.
- Any precautions or procedures that the host employer had implemented for the protection of employees in or near the confined space where contractor personnel will be working.
Contractors

- **Employers shall evaluate potential contractors** to ensure they have appropriate qualifications for the full scope of work to be performed, including a confined space safety program meeting this standard.

- **Identification of Rescue Responder.** The employer and contractor shall establish who will serve as the rescue responder in an emergency and what system will be used to notify the responder that an emergency exists.

- **Permit System.** Contractors shall ensure a permit program is being followed, meeting the requirements of this standard.

- **Ongoing Dialogue.** The contractor must inform the host employer immediately of
ANSI/ASSE:

• ANSI/ASSE Z117.1-2009, Safety Requirements For Confined Spaces

CSA:

• CSA Z1006-10, Management of Work in Confined Spaces

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