Great Western Painting

Inert Space Entry

29 CFR 1910.1046, *Permit-Required Confined Spaces*

INERT SPACE ENTRY

Per 29 CFR 1926.21(b)(6)(i), *Safety Training and Education*, all employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. The provisions of 29 CFR 1910.146, *Permit-Required Confined Spaces*, applies to inert space entry because the specific vessel our employees will enter:

1. is large enough and so configured that an employee can bodily enter and perform assigned work; and
2. has limited or restricted means for entry or exit; and
3. is not designed for continuous employee occupancy; **and**
4. is a **permit-required confined space** because, in addition to the above it has a recognized serious safety or health hazard, specifically, an **IDLH oxygen-deficient atmosphere**.

Training:

Training will be provided to all employees whose work is regulated by this plan prior to entry into an inert space.

The training certification will include the employee's name and signature; the trainer's name and signature/initials; and dates of the training. This will be available for inspection by the employees and their authorized representatives.

Training will be accomplished before any assignment involving permit-required confined space operations and when there is a change in assigned duties. Further training will be given at the introduction of a new hazard for which they have not been trained.

Training will ensure that these persons have the knowledge and skills necessary for the safe accomplishment of their assigned tasks within an inert space entry. Training will include the duties and responsibilities of following positions: Authorized Entrant, Attendant, Entry Supervisor, and Rescue Team Member.

Should actual job experience indicate a lack of knowledge or proficiency, training will be re-accomplished.

Training for the various permit-required confined space job positions is noted below.

Authorized Entrants:

Authorized Entrants will be trained in:

a. an awareness of the hazards that may be encountered during entry, including: information on the mode, signs or symptoms, and consequences of the exposure.

b. proper use of monitoring equipment, communications equipment, personal protective equipment, lighting equipment, rescue equipment, entry and egress equipment, barriers to protect entrants from external hazards, and other equipment necessary for safe entry into and rescue from permit spaces.

c. the skills necessary to communicate with the Attendant should a reason for evacuation be present.

d. the requirement to alert the Attendant whenever:

   1. the entrant notices a warning sign or symptom of exposure to a dangerous situation. An example of this may be a tingling of the skin, dizziness, or a headache. Consult the Material Safety Data Sheets for information on specific chemical hazards.

   2. a prohibited condition is detected.

e. exit procedures which include the need to exit the permit space as quickly as possible whenever:

   1. an order to evacuate is given by the attendant or the Entry Supervisor.

   2. the entrant recognizes any warning sign or symptom of exposure to a dangerous situation.

   3. a prohibited condition is recognized.

   4. an evacuation alarm is activated.

Attendants:

Attendants will be trained in:

a. an awareness of the hazards that may be encountered during entry, including the mode, signs or symptoms, and consequences of the exposure.

b. an awareness of possible behavioral effects of hazard exposure in Authorized Entrants.

c. the method used to continuously maintain an accurate count of Authorized Entrants in the permit space and the use of a roster on the entry permit to readily identify who is in the permit space.

d. the requirement that, while an external rescue attempt may be attempted (such as the use of an external retrieval system), they may not attempt to enter a permit-required confined space to attempt a rescue under any circumstances unless:

    1. they are relieved by a second Attendant.
    2. they are thoroughly trained and certified in appropriate rescue techniques as required by the Rescue and Emergency Services Plan of this Program.

e. communication procedures, as necessary, with Authorized Entrants to monitor entrant status and alert entrants of the need to evacuate if one of the following conditions presents itself:

    1. a prohibited condition is detected by the Attendant.
    2. the Attendant detects the behavioral effects of hazard exposure in an Authorized Entrant.
    3. the Attendant detects a situation outside the space that could endanger the Authorized Entrants.
    4. the Attendant realizes that he/she cannot perform all the required duties of this Plan.

f. the procedures to summon rescue and other emergency services as soon as the Attendant determines that Authorized Entrants need assistance to escape from permit space hazards.

g. taking the following steps when unauthorized persons approach or enter a permit space while entry is underway:

    1. warn the unauthorized persons that they must stay away from the permit space.
    2. advise the unauthorized persons they must exit immediately if they have entered the permit space.
    3. inform the Authorized Entrants and the Entry Supervisor if unauthorized persons have entered the permit space.

h. the procedures for safe non-entry rescues as specified by our rescue procedure.

i. an awareness that no duties may be performed which might interfere with the Attendant's primary duty to monitor and protect the Authorized Entrants. **The stand-by person (Attendant) must remain outside the inert space during entry operations until relieved by another stand-by person.**

Entry Supervisor:

The Entry Supervisor will be trained in:

a. an awareness of the hazards that may be encountered during entry including information of the mode, signs, symptoms, and consequences of the hazard exposure.

b. verification procedures, especially checking that the appropriate entries have been made on the permit, that all tests specified by the permit 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.

c. termination procedures. Operations will terminate when:

   1. the entry operations covered by the entry permit have been completed [at this point the permit will be canceled], or

   2. a condition arises in or near the permit space that is not allowed.

d. verifying that rescue services are available and that means for summoning them are operational.

e. an awareness that unauthorized personnel who enter or attempt to enter the permit space must be removed.

f. maintaining entry operations consistent with the terms of the entry permit. Whenever responsibility for a permit space entry operation is transferred, and at intervals dictated by the hazards and operations performed within the space, the entry operations must remain consistent with the terms of the entry permit and acceptable entry conditions must be maintained.

Rescue and Emergency Services:

Rescue and Emergency Services (Teams and/or Personnel) will be trained and knowledgeable in all areas applicable to Authorized Entries as well as:

a. the use of personal protective equipment and rescue equipment.

b. rescue duties consistent with the permit space involved and the identified hazards or potential hazards.

c. first aid -- at least one (1) member of a rescue team will be certified in basic first aid and CPR. Rescue team members will be on site to be able to provide emergency first aid and CPR in a timely manner.

Assigned rescue personnel must complete permit space simulated rescues at least once every twelve (12) months from representative permit spaces similar to the permit space in question with regard to size, configuration, hazards involved, accessibility, and opening size.

Job Site Analysis (JSA):

The Entry Supervisor, working with employees and rescue personnel who actually perform tasks during the inert space entry, will use a worksheet for that task listing all components of the individual tasks. **The JSA will be prepared prior to entry of the vessel**. Working together, they will list all things that could go wrong resulting in an accident. Finally, specific steps will be developed to eliminate the probability of an accident. These steps will be transferred to our task analysis form which will be kept on the job site.

At a minimum, the written JSA will address all the risks associated with the work such as:

1. setting up the inert entry and catalyst handling equipment at the work site.
2. access and egress to the equipment.
3. provisions for adequate lighting.
4. control of employee access.
5. lifting and rigging activities.
6. removal of vessel internals.
7. installation of warning signs.

The JSA will identify for each task:: a) sequence of basic job steps, b) potential hazards/accidents, c) recommended safe job procedures, d) equipment to be used, e) inspection requirements, and, f) training requirements.

The Entry Supervisory can be assured that the **contents of the JSA are communicated to the involved personnel** because they are involved in its preparation.

Heat Stress Plan:

A documented heat stress plan will be available on site. All personnel involved with the inert space entry will be given instruction in this plan prior to working in heat illness – heat stress inducing environments.

The plan will address the danger of heat illness – heat stress, the procedures to lessen its impact, and, in the worst case, the procedure for medical response.

All persons should recognize the symptoms of heat related illness. Symptoms and first aid procedures are on the following pages.

HEAT EXHAUSTION

(Fatigue; weakness; profuse sweating; normal temperature; pale clammy skin; headache; cramps; vomiting; fainting)

Remove from hot area.
Have victim lay down and raise feet.
Apply cool wet cloths.
Loosen or remove clothing.
Allow small sips of water if victim is not vomiting.

HEAT STROKE

(Dizziness; nausea; severe headache; hot dry skin; confusion; collapse; delirium; coma and death)

Call for immediate medical assistance.
Remove victim from hot area.
Remove clothing.
Have victim lay down.
Cool the body (shower, cool wet cloths)
Do not give stimulants.

The purpose of this program is to take definitive measures **prior** to the onset of heat exhaustion and heat stroke so that medical response will not be necessary. This would include most importantly the provisions of water, modified work procedures, and **rest** as noted below.

Because trained rescue personnel will be present during inert space entry (See Rescue Plan), immediate medical response will be available.

Provision of rest (recovery period)

PERMISSIBLE HEAT EXPOSURE THRESHOLD LIMIT VALUE

	---------- Work Load* ----------		
Work/rest regimen	**Light**	**Moderate**	**Heavy**
Continuous work	30.0°C (86°F)	26.7°C (80°F)	25.0°C (77°F)
75% Work, 25% rest, each hour	30.6°C (87°F)	28.0°C (82°F)	25.9°C (78°F)
50% Work, 50% rest, each hour	31.4°C (89°F)	29.4°C (85°F)	27.9°C (82°F)
25% Work, 75% rest, each hour	32.2°C (90°F)	31.1°C (88°F)	30.0°C (86°F)

*Values are in °C and °F, WBGT.
These TLV's are based on the assumption that nearly all acclimatized, fully clothed workers with adequate water and salt intake should be able to function effectively under the given working conditions without exceeding a deep body temperature of 38°C (100.4° F).
These TLV's apply to physically fit and acclimatized individuals wearing light summer clothing. If heavier clothing that impedes sweat or has a higher insulation value is required, the permissible heat exposure TLV's in Table III:4-2 must be reduced by the corrections shown in Table III:4-3.

Source: ACGIH 1992

Note: We will follow the above work/rest regimen based on ACGIH Threshold Limit Values.

Tools and Equipment:

Inert space entry requires specialized tools and equipment. Prior to use, and as needed, all equipment used during entry will be inspected and must be in good work order.

Communication System:

The communication system used during inert space entry will be capable of simultaneous communications between all persons involved in the entry including: the entry supervisor, the authorized entrants, the attendants, and the rescue personnel. In this manner, c**ommunications will be maintained between working inside the inert atmosphere.**

Should communication not be maintained **(fail)**, all personnel within the inert space will immediately evacuate the space.

Protection from External Hazards:

The area around the Inert Entry Operation must be barricaded to limit personnel in the area. The perimeter of this regulated area will be a minimum of 4-feet from the vessel opening or manway.

Respiratory Protection:

Technicians entering the inert space must wear a helmet which is sufficiently secured to prevent inadvertent removal A “clam type” helmet with integral breathing air which cannot be accidentally removed or displaced is acceptable.

Air supply must be Certified Grade D quality breathing air and must be checked and tagged by Safety personnel before use at the site. Only bottled air is permitted.

The technician entering the inert space must wear an auxiliary escape air bottle.

A periodic log or checklist of continuous air monitoring will be maintained for the inert space. Log entries should not exceed 15 minutes.

Rescue and Emergency Service Plan:

Should an employee be assigned to be a member of a Rescue Team, that employee must have had documented training in:

a. proper use of personal protective equipment and rescue equipment.
b. the same training as required of the entrant.
c. a simulated rescue within at least twelve (12) months in the same type of inert space (i.e., representative space of the same general dimensions, opening size, hazard type, and accessibility.)

At least one member of the Rescue Team must be trained and certified in

basic first aid and cardiopulmonary resuscitation (CPR) and that documentation will be on file. This person must also have training in bloodborne pathogens and exposure control.

The attendant will ensure that only authorized rescue personnel identified on the entry permit be allowed to attempt a rescue.

We will notify the local Emergency Rescue Department before permit-required confined space entry is made to coordinate a possible rescue before the fact. The local Emergency Department will be informed of the exact location of the project, the hazards involved, the number of entrants, the types of protective equipment worn by the entrants, and a practice rescue will be accomplished and documented. Because the entry involves an IDLH situation, **the rescue team will be on-station during entry.**

Retrieval systems for non-entry rescue will be used **where possible**, in lieu of actual entry, unless the retrieval system would contribute to the overall risk of the entrant.

Retrieval systems to be considered include:

a. a chest or full body harness with a retrieval line attached at the center of the entrant's back near shoulder level.

b. wristlets if they create a lesser danger to the entrant than the above.

c. a retrieval line attached to a mechanical lifting (pulling) device fixed to an anchorage outside the permit space.

Should a potential rescue be required to retrieve an entrant from a five (5) foot vertical drop, a mechanical retrieval device will be employed.

The Attendant will have on site the MSDS for all chemical substances to which the entrant will be exposed. The emergency responders as well as the treating hospital will be provided this information.

The written rescue and emergency plan, developed with the Entry Supervisor, the personnel involved with the inert gas entry, and the rescue personnel, will be available on site.

Provision of the plan will include, but not be limited to:

1. loss of nitrogen supply.
2. high nitrogen pressure.
3. high vessel oxygen.
4. high/increasing vessel temperature.
5. loss of breathing air supply.
6. emergency inside the vessel.
7. plant emergency outside the vessel.