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## Purpose

The entry into a confined space is potentially one of the most dangerous activities associated with any hazardous substance operation. Due to the unique conditions that can exist, great care must be taken both before and during this type of work procedure.

Note: Total energy isolation is required before any entry will be allowed.

## Scope

Some clients have specific Confined and/or Permit Confined procedures or requirements for contractors working on their job site. ANC Foster employees shall follow client requirements for Confined and/or Permit Confined procedures or requirements as long as they meet or exceed the ANC Foster Confined Spaces Procedure. This applies to all ANC Foster operations.

## Definitions

A “confined space” is an enclosed or partially enclosed space that is not designed or intended for continuous human occupancy with a restricted means of entry or exit and may become hazardous to a worker entering it because:

- of its design, construction, location or atmosphere,
- of the work activities, materials or substances in it,
- the provision of first aid evacuation, rescue or other emergency response service is compromised, or
- of other hazards relating to it

Acceptable entry conditions refer to conditions that must exist in a confined space to allow personnel to enter and to ensure they can safely complete their work while in that confined space.


Stand-by person refers to a person stationed outside the confined space who monitors the authorized entrants, and performs the duties assigned to them by this written program. (Also called “attendant”, “lookout” or “hole watch”).

Authorized Entrant refers to personnel who are authorized under this written program to enter a confined space.

Emergency refers to an event that could endanger an authorized entrant whether it occurs inside or outside the permit space.

Entry refers to the entrance of a person into a confined space. Note: Entry is considered to begin when the feet or head breaks the plane of entry into the space.

Entry Permit refers to the written document that controls entry into a confined space, and contains all pertinent information required by local regulatory requirements.

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Entry Supervisor refers to the person designated with the responsibility to determine acceptable entry conditions, and to authorize, supervise, or terminate any entry.

Hazardous Atmosphere refers to an atmosphere which may expose a person to the risk of death, incapacitation, injury, acute illness, or impaired ability to escape unaided from an emergency. An atmosphere is considered hazardous if it contains one or more of the following:

- Atmospheric oxygen concentration below 19.5% or above 23.0%.
- Flammable gas, vapours, or mists in excess of 10% of its lower explosive limit (LEL).
- Airborne combustible dust at a concentration that meets or exceeds its LFL, lower flammability limit, or (if the dust obscures vision at a distance of 5 feet).
- Atmospheric concentration of any substance where personnel exposure would exceed any listed toxic dose or permissible exposure limit.
- Any other atmospheric condition that is immediately dangerous to life and health.

IDLH (immediately dangerous to life and health) refers to a condition that threatens loss of life, adverse health effects, or impaired ability to escape unaided from an emergency.

Oxygen Deficient Atmosphere refers to an atmosphere that contains less than 19.5% oxygen content.

Oxygen Enriched Atmosphere refers to an atmosphere that contains more than 23.5% oxygen content.

Retrieval System refers to equipment which non-entry personnel can use to retrieve persons from a confined space in the event of emergency.

Testing refers to a process used to identify and evaluate a potentially hazardous atmosphere with monitoring instruments.

## Documentation


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The following records must keep and be maintained:

- Entry permits in relation to work in confined spaces for a period of one month after return of the confined spaces to service;
- Risk assessment reports in relation to work in confined spaces for 5 years after the date of preparation; and
- Records of training in relation to work in confined spaces for the terms of employment of persons to whom the training has been provided.

The documents referred to above are to be kept for such period as is appropriate in cases where continued surveillance of the health of employees or other continued monitoring is required.

All records kept are to be made available to regulatory authority inspectors and employees (in relation to their own personal circumstances) on request.

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## Preliminary Planning

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Planning must include:


- Written procedures for recognizing and identification of hazards that may be present in the hazardous confined space and may put the health or safety of workers at risk and the risks associated with working in the confined space.
- Written procedures specifying the means to eliminate or minimize all hazards likely to prevail must be developed based on the hazard assessment.
- Written safe work procedures to enter, work in and exit from the hazardous confined space safely.
- Methods for isolating and lockout including blanking, disconnecting, interrupting and locking out pipes, lines and all sources of energy from a confined space.
- Prior to performing work in a confined space all equipment that is required to safely perform confined space work, including personal protective equipment and rescue equipment, is available and inspected to ensure it is in good working order. Inspections shall be written and retained.
- An emergency response plan and rescue procedures to be implemented in the event of an accident or other emergency in a confined space, including the number and duties of personnel and the availability, location and proper use of rescue equipment including lifelines, harnesses and lifting equipment.
- Entry permits.
- Ventilating, cleaning, purging or inerting the hazardous confined space.
- Stand-by persons.
- Coordination of work activities.
- Atmospheric tests, measurements and monitoring necessary to monitor any oxygen deficiency or enrichment or the presence and hazardous concentration of flammable or explosive substances. The results of the tests are recorded on the entry permit.
- Availability, location and proper use of personal protective equipment.
- Means to maintain effective communication with a worker who has entered the hazardous confined space with a standby person or other personnel outside the space.
- Availability, location and proper use of any other equipment that a worker may need to work safely in the hazardous confined spaces.
- That workers are trained in and who will implement a hazardous confined space entry plan including a worker who is required or permitted to enter, a worker who tends to a worker in the space, and a worker who may be required or permitted to implement the rescue procedures.
- An assignment of responsibilities.
- A list of each confined space or group of similar spaces and a hazard assessment of those spaces.
- How to take all reasonably practicable steps to prevent any unauthorized entry into the confined space.

## Hazard Assessment

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Before a worker is required or permitted to enter a confined space ANC Foster shall appoint a competent person to prepare a report in writing to:

- Identify and assess the hazards the worker(s) are likely to be exposed to while in the confined space or restricted space,

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- Specify the type and frequency of inspections and tests necessary to determine the likelihood of worker exposure to any of the identified hazards,
- Perform inspections and tests specified,
- Specify the safety and personal protective equipment required to perform the work, and
- Identify the personal protective equipment and emergency equipment to be used by a worker who undertakes rescue operations in the event of an accident or other emergency.

The report shall include the assessment, tests and determinations, recommended special precautions and procedures to reduce the risk to a worker that are to be followed by a worker entering into, exiting from or occupying the confined space and recommended personal protective equipment to be used by a worker entering the confined space.

The hazard assessment must be conducted for each:

- Condition which may exist prior to entry due to the confined space's design, location or use, or which may develop during work activity inside the space.
- Potential for oxygen enrichment and deficiency, flammable gas, vapour or mist, combustible dust, other hazardous atmospheres, harmful substances requiring lockout and isolation, engulfment and entrapment, and other hazardous conditions.
- Confined space, confined space types at the worksite or each group of confined spaces which share similar characteristics
- Work activity, or group of work activities which present similar hazards, to be performed inside a confined space.
- Types of hazards that are or may be present at each confined space.

Before requiring a worker to enter or work in a confined space ANC Foster must identify and assess:

- And take measures to reduce, control or eliminate the risks to safety or health associated with the confined space.
- Alternative means to perform the work in a confined space that will not require the worker to enter the confined space and
- Alterations to the physical characteristics of the confined spaces that may be necessary to ensure safe entrance to and exit from all accessible parts of each confined space.


### **Pre-Entry Conditions**

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No person shall enter a confined space or carry on work inside or on the outside of a confined space if:

- There is a risk to the health and safety of a person entering, occupying or working on the surface of the confined space; or
- There is a risk of fire or explosion.

A Confined Space Register shall be maintained and all confined spaces identified by signage.

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A safe oxygen level means a minimum oxygen content in air of 19.5% by volume under normal atmospheric pressure and a maximum oxygen content in air of 23.5% by volume under normal atmospheric pressure.

No person shall enter a confined space unless all potentially hazardous services that are normally connected to the confined space are isolated or otherwise controlled so as to prevent:

- The introduction of any materials, contaminants, agents or conditions that may be harmful to a person occupying the confined space; or
- The activation or energizing in any way of equipment or services that may pose a risk to the health or safety of a person inside the confined space.

A confined space must be cleared of all contaminants by use of a suitable purging agent by which contaminants are displaced from the confined space before a person enters the confined space.

Pure oxygen or a gas mixture in a concentration of more than 21% of oxygen by volume shall not be used for the purging or ventilation of a confined space.

### **Pre-Entry Atmospheric Testing**

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No person shall enter a confined space unless:

- The confined space contains a safe oxygen level;
- Any atmospheric contaminants in the confined space are reduced below the appropriate exposure standards referred to in clause 51 (Atmospheric Contaminants—particular risk control measures);
- The confined space is free from extremes of temperature; and
- The concentration of any flammable contaminant in the atmosphere of the confined space is below 5% of its LEL.

ANC Foster must ensure that, if a concentration of flammable contaminant in the atmosphere of a confined space is found to be more than 5% of its LEL and less than 10% of its LEL, all persons leave the confined space unless a continuous monitoring, suitably calibrated flammable contaminant detector is used in the confined space at all times while persons are present in it.


ANC Foster must ensure that, if a concentration of flammable contaminant in the atmosphere of a confined space is found to be 10% of its LEL or more, all persons leave the confined space.

If a safe oxygen level cannot be provided or atmospheric contaminants cannot be reduced to safe levels in a confined space, persons may enter the space if equipped with suitable personal protective equipment including air supplied respiratory protective equipment.

### **Signage**

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If an atmospheric contaminant is present in a confined space or a confined space contains less than 19.5% oxygen, ANC Foster must provide warning signs.

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Appropriate signs must be displayed and protective barriers erected to prevent the entry into a confined space of persons who are not authorized by an entry permit referred to in the entry permit.

## Entry Permit

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No person shall enter or work in or on a confined space unless authorised by an entry permit given by ANC Foster.

An entry permit must:

- Be in writing;
- Identify the confined space;
- Clearly describe the work to be carried out in or on the confined space;
- Set out risk control measures to be taken;
- Record the names of all persons who may enter or work in or on the confined space; and
- Record the dates and times when the persons may enter or be in or on the confined space to carry out the work.

The entry permit must be provided to the person responsible for direct control of the work to be carried out in or on the confined space.

ANC Foster must ensure that the persons who are to carry out the work are informed of and comply with the requirements of the entry permit.

ANC Foster must ensure that before authorisation is given for the confined space to be returned to service the person in direct control of the work in the confined space acknowledges, in writing, that:

- The work in or on the confined space has been completed; and
- All persons involved in the carrying out of the work have left the confined space.

## Isolation of the Space


Sources of energy shall be isolated from the confined space to ensure that workers within a confined space are protected against the release of hazardous substances or energy that could harm them. No worker shall enter a confined space unless adequate precautions are in place to protect a worker from drowning, engulfment, or entrapment. Any hazardous energy in a restricted or confined space is locked/ tagged out.

## Entry Procedures

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ANC Foster personnel will not be allowed to enter a permit confined space unless the following procedures are adhered to:

The confined space must be properly tested for acceptable ranges of oxygen content, flammable atmosphere, and toxic concentrations present, using a calibrated, direct-reading, gas-monitoring instrument, operated by a trained supervisor. (There can be no longer than a 2hr time-gap between tests performed and any space entry.) Monitoring results will be reviewed with all entrants.

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The permit space shall be identified by appropriate signs, and the external area barricaded to ensure that no unauthorized persons, equipment, or vehicles present a danger to authorized entrants.

A safe means of entry and exit shall be available to all workers required to work in a confined space and rescue personnel attending to the workers. Examples of methods to ensure safety include secured steps, temporary platforms and handrails may be suitable in certain circumstances, and ensuring the area is free and workers protected from traffic hazards in the vicinity of the confined space.

No smoking or flammable, combustible materials are allowed within this barricaded area. A properly inspected, charged ABC dry chemical fire extinguisher is required to be outside the permit space, ready to use. No welding gas tanks are allowed inside the permit space, and all hoses, regulators, leads, electrode holders or other welding/cutting equipment will be inspected prior to entry into the permit space. Equipment found to be defective will not be allowed for use.

Communication methods will be by voice/visual contact, or 2-way radios that are required to be intrinsically-safe in design.

Properly inspected, approved entry/exit means will be secured into position, following all established safe, ladder-use guidelines.

Ventilation equipment will be activated and provide continuous forced air from clean air sources, so that proper air exchanges for the enclosed space is maintained at all times for permit space occupancy.

Approved, properly-rated (12V, explosion-proof) light sources, or intrinsically-safe flashlights will be provided for safe illumination while working inside a permit space.


Appropriately selected personal protective equipment will be donned prior to vessel entry, and worn at all times while inside the permit space. All PPE shall be inspected by a competent individual before use. Defective equipment shall not be used, but instead discarded, and replaced. (Examples are hard hats, splash/impact goggles, face-shields, safety glasses, respirators, protective clothing, steel-toed shoes, ear plugs, & gloves.)

After the space has been tested and declared safe for entry, the entry permit shall be completed, conditions explained to all authorized personnel, signed by all authorized personnel, and posted at a conspicuous location on the vessel.

The stand-by person shall be assigned to their appropriate duties; the entrants may then enter inside the confined space, and the entry supervisor accountable for maintaining safe operations.

Permits will be cancelled upon completion of work, or for emergency evacuation due to dangers occurring inside or outside the space that could directly affect the life or health of an entrant.

If an emergency occurs and evacuation of the space is required, the space will be re-evaluated to determine the cause, extent, and nature of the hazard encountered. The hazard will be eliminated before entry is again permitted, after inspection and testing is satisfactory.

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## Stand-by Person

There must be one or more stand-by persons present outside a confined space when any person is inside the confined space.

The stand-by person means a competent person who:

- Is assigned to remain on the outside of, and in close proximity to, the confined space;
- Is capable of being in continuous communication with and, if practicable, able to observe persons inside the confined space;
- Is capable of operating monitoring equipment used to ensure safety during entry to and work in the confined space; and
- Is capable of initiating emergency procedures (including rescue procedures), if necessary.

ANC Foster shall ensure that all “authorized entrants”:

- Know the hazards that may be faced during entry, including information on the mode, signs, or symptoms, and consequences of exposure.
- Properly use equipment as required. Ensure all equipment to be used has been inspected by a competent person prior to use.
- Communicate with the attendant as necessary to enable the attendant to monitor the entrant(s) status and to alert entrant(s) of the need to evacuate the space as required.

Authorized Entrants must alert the attendant when:

- They recognize any warning sign or symptoms of exposure to a dangerous situation.
- They detect a prohibited condition.

Authorized Entrants must exit from the permit space as quickly as possible when:


- An order to evacuate is given by the attendant or the entry supervisor
- They recognize any warning sign or symptom of exposure to a dangerous situation.
- They detect a prohibited condition.
- An evacuation alarm is activated.

ANC Foster shall ensure that all stand-by personnel:

Know the hazards that may be faced during entry, including information on the mode, signs, symptoms, and consequences of the exposure.

Procedures will be developed for each confined space to properly protect personnel during entry. Barriers will be constructed as necessary to protect entrants from external hazards such as pedestrian, vehicle, or other external hazards.



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In addition, procedures must be developed for each confined space to verify that conditions in the permit space are acceptable for entry during its duration.

Attendants are aware of possible behaviour effects of hazard exposure in authorized entrants.

Continuously maintain an accurate count of authorized entrants in the permit space and ensure that the means used to identify authorized entrants accurately identifies who is in the permit space.

Remain outside of the permit space during entry operations and cannot leave the area until all workers have left the confined space or relieved by another attendant. Any unauthorized personnel will be prohibited from attempting any type of rescue.

Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and order the authorized entrants to evacuate the permit space immediately under any of the following conditions:


- If they detect a prohibited condition
- If Oxygen levels fall below 19.5% or rise above 23%
- If rescue and emergency services are unavailable for any reason
- If they detect the behavioural effects of hazard exposure in an authorized entrant
- If they detect a situation outside the space that could endanger the authorized entrants
- If they cannot, for any reason, effectively and safely perform all the duties required.
- Summon rescue and other emergency services as soon as they determine that authorized entrants may need assistance to escape from permit space hazards. By whatever means are available (voice, radio, phone), the attendant shall notify their immediate supervisor, or host facility operator for emergencies.
- Take 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 entrants and the entry supervisor if unauthorized persons have entered the permit space.
  - Perform non-entry rescue as specified by the ANC Foster rescue procedure.
  - Perform no duties that might interfere with their primary duty to monitor and protect the authorized entrants.

## Monitoring

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Appropriate atmospheric testing and monitoring must be carried out if a confined space has or may:

- Become contaminated with an atmospheric contaminant;
- Become contaminated with a flammable contaminant; or
- Have an oxygen level that is not a safe oxygen level.

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Continuous or intermittent monitoring of the permitted space may be implemented depending on the potential atmospheric conditions that may be experienced during operations. ANC Foster personnel or their representative are entitled to request additional monitoring at any time, if they believe changes have occurred.

If an instrument reading ever indicates an unusual, unexpected, or unacceptable atmospheric condition, it is never to be ignored, or assumed to be due to instrument error.

Note: If a bad reading is recorded, all necessary measures will be taken to correct the situation (re-calibrate instrument, ventilate space, etc.) ANC Foster personnel will not be expected to enter confined spaces until it is deemed safe to do so, and the acceptable entry conditions recorded on the entry permit.

## Lighting

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Lighting sources to be used in the permit confined space shall be explosive-proof and specifically approved by a recognized agency.

Any electrically-operated tool taken inside the permit space shall be double insulated, inspected for defects, and connected to an approved ground fault circuit interrupter that has been inspected and tested prior to use.

All ladders used for entry/exit into the permit confined space must meet all applicable codes and standards as outlined in local regulatory requirements and inspected prior to use. They must not interfere with rescue or retrieval systems, ventilation methods, and work operations.

## Rescue and Emergency Services

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When persons are inside a confined space there must be readily available emergency equipment (including rescue and first aid equipment) appropriate for the particular circumstances in which the persons are inside the space.

ANC Foster must ensure that emergency procedures are planned, established and rehearsed in relation to the presence of persons in a confined space.

ANC Foster must ensure that:

- Openings for entry to and egress from a confined space are of adequate size to permit the rescue of all persons who may be in the space; and
- Openings are not obstructed by fittings or equipment that could impede the rescue of persons or, alternatively, if this cannot be done, that another suitable means of rescue is provided.


## Training

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Training must be provided for all persons who are required to work in or on a confined space in all relevant activities relating to entering and working in or on the confined space.

The training program must include instruction in the following:

- The hazards of confined spaces;

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- Risk assessment procedures;
- Risk control measures;
- Emergency procedures; and
- Selection, use, fitting and maintenance of safety equipment.

Training must also be provided for persons who:

- Perform assessments in relation to the safety of confined spaces;
- Issue entry permits for work in confined spaces;
- Design and fix the layout of work places;
- Manage or supervise (or both) persons working in or near confined spaces, including any contractor;
- Maintain equipment used for and during entry to confined spaces;
- Purchase, distribute, fit, wear or maintain personal protective equipment used in relation to the carrying out of work in confined spaces;
- Are on stand-by in relation to work in confined spaces; or
- Are involved in rescue and first aid procedures in relation to work in confined spaces.

ANC Foster must make a written record of:

- The training provided; and
- The persons to whom the training is provided.