

BODEGA BAY FIRE DISTRICT
STANDARD OPERATING PROCEDURE

WRITTEN BY: *[Signature]* APPROVED BY: *[Signature]* NUMBER: 21

SUBJECT: **CONFINED SPACE EMERGENCIES**

DATE: 19MAR96

I. PURPOSE

To provide an outline of operations, procedures, responsibilities, and minimum safety requirements to be followed while entering, exiting, and working in confined spaces at normal atmospheric pressure.

II. RESPONSIBILITY

It will be the responsibility of each member to exercise appropriate command and control dictated by his/her rank in the implementation of this Operational Procedure.

III. CLASSIFICATIONS

NIOSH (National Institute for Occupational Safety and Health) has three (3) classifications for confined spaces, based on life threatening characteristics:

- A. Class A - an environment which is immediately dangerous to life or health (entry by permit only; shall have a posted sign).
- B. Class B - an environment that has the potential for causing injury and illness if preventative measures are not used; but is not immediately dangerous to life or health.
- C. Class C - an environment that has potential hazards which would not require any special modifications of the work procedures.

IV. DEFINITIONS

A. Confined Space

- 1. One large enough and so configured that a person can bodily enter and perform work; and
- 2. One that has limited or restricted means of entry or exit; and
- 3. One that is not designed for continuous occupancy.

B. Non-permit confined space

A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

C. Permit-required confined space (permit space)

A confined space that has one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere;
2. Contains a material that has the potential for engulfing an entrant;
3. Has an internal configuration such that an entrant could be trapped.

D. Lockout/Tag Out

The placement of a lock/tag on the energy isolating device in accordance with an established procedure, indicating that the device shall not be operated until the removal of the lock/tag.

E. Hazardous Atmosphere

1. Any atmosphere which may cause immediate or delayed death, injury, or disease, and exposures are toxic, poisonous, corrosive, flammable, or has the ability to be physically incapacitating or dangerous.
2. Hazardous atmospheres include: Levels of flammability of 10% of the lower explosive limit (L.E.L.); oxygen deficient atmospheres with levels below 19.5%, or enriched atmospheres above 23.5%; or airborne combustible dust greater than its L.E.L.; Levels of radiation and Radioactivity above permissible exposure limit; any atmospheric condition that is immediately dangerous to life or health .

F. Immediately dangerous to life or health (IDLH)

Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

G. Qualified Person(s)

One who is capable of identifying hazards in the work area or working conditions that are hazardous or dangerous to personnel, and who is authorized to take corrective measures to eliminate them. One who has trained and is familiar with accepted confined space standards and requirements.

H. Attendant

An individual stationed outside the confined space who is trained as required to monitor conditions, i.e., entrance/exit of authorized entrants, monitoring of atmospheric conditions, communicating with authorized entrants, etc... (fire department employees).

I. Authorized Entrant(s)

An individual trained to the level of Attendant with the addition of understanding the hazards faced, proper use of personal protective equipment, use of patient/victim extrication equipment and procedures, communication systems, etc... (fire department employee).

J. Entry Supervisor

An individual trained to the level of Authorized Entrant. Entry Supervisors may often be the ranking officer trained in confined space on scene. He/she may have additional training on signs and symptoms indicative of exposure to potential hazards and will confirm that operations are consistent with applicable standards (fire department employee).

V. CONFINED SPACE DESCRIPTIONS

A. Open Topped Enclosures

Spaced with depths that restrict the natural movement of air (e.g., degreasers, pits, waste water digesters, selected types of tanks and excavations).

B. Enclosures with Limited Openings

Spaces with extremely limited openings for entry or exit (e.g., sewers, casings, tanks, manholes, vaults, and silos).

VI. PRECAUTIONS

- A. A major cause of confined space injuries and/or fatalities is the failure to recognize the incident for what it is -- A Confined Space Incident.
- B. Do not underestimate the seriousness of confined space incidents. More than half of the casualties of confined space incidents are rescuers.

VII. CONSIDERATIONS

A. Hazard Identification

Hazards shall be identified for each confined space. The hazard identification process shall include, but not be limited to, review of the following:

1. The past and current uses of the confined space which may adversely effect the atmosphere of the confined space.
2. The physical characteristics, configuration, and location of the confined space.
3. Biological hazards.
4. Mechanical or physical hazards.
5. Existing or potential hazards in the confined space such as:
Flammable And Toxic Environments (FATE).
 - a. Four distinct categories of hazardous atmospheres:
 - 1) Flammable
 - 2) Toxic
 - 3) Irritants and/or corrosives
 - 4) Asphyxiating
 - b. Common gases found in below-grade or confined space operations:
 - 1) Carbon dioxide
 - 2) Carbon monoxide
 - 3) Hydrogen sulfide
 - 4) Methane
 - 5) Sulfur dioxide

NOTE #1 - A group of gases may stratify within a confined space. This is one reason why one person may survive exposure to gas on one level, while another dies from exposure to the same or a different gas at another level.

NOTE #2 - Physical/mechanical hazards may also be encountered. Areas of concern are utility installations, certain types of machinery, areas offering extremely limited working areas, etc.

VIII. RESPONSE

A. The normal dispatch to a Confined Space Emergency will include:

1. Nearest Engine Company
2. Nearest Truck/Rescue Company
3. Advance Life Support Ambulance Unit
4. District Chief

When information indicates the need for additional equipment the District Chief shall respond needed equipment (i.e., Haz Mat, Rescue, Truck Company)

IX. STANDARD OPERATING PROCEDURE (PRE-ENTRY)

A. Size-up

1. Recognize the emergency as a confined space rescue incident.
2. Activate the Incident Command System to the degree necessary to control the emergency. Accumulate information required to conclude the operation safely. Plan operations and alternatives carefully, considering hazards that may be faced specific to the confirmed space's use. Develop a written Plan of Operation.
3. Assign and/or have a Safety Officer activated to work in conjunction with the Entry Supervisor and Authorized Entrants to ensure members' safety.

NOTE - In situations where personnel on scene are minimal, it is appropriate for the Safety Officer to serve a dual role as Attendant/Safety Officer or Entry Supervisor/Safety Officer.

4. Consult with plant engineers and plant emergency responders (qualified personnel) as to the characteristics of the involved confined space.

B. Stabilize the Immediate Area

1. Set up a safe operations perimeter.
2. Confirm "Lockout/Tag Out" condition for the affected confined space.

C. Test the confine space internal atmosphere.

1. Using a calibrated direct-reading instrument test the internal atmosphere for the following conditions in the given order:
 - a. Oxygen content
 - b. Flammable gases and vapors, and
 - c. Potential toxic contaminants.
2. Atmospheric monitoring shall continue while the confined space is occupied.

D. Eliminate Ignition Sources

1. Park apparatus outside the Operations Area
2. It may be necessary to shut down plant operations in the immediate area.
3. Do not take equipment that could serve as an ignition source into the area.
 - a. Conventional floodlights and hand lights are not intrinsically safe or explosion-safe.
 - b. The District's portable radios are not intrinsically safe or explosion proof. Keying the mike may provide an ignition source in an explosive atmosphere..

D. Forced Air Ventilation

1. Forced air ventilation shall be so directed as to ventilate the areas that are occupied and shall continue as long as the space is occupied.

E. Providing Lighting

1. Keep floodlights outside of immediate area.
2. Use only intrinsically safe or explosion proof hand lights in the operational area.

X. STANDARD OPERATING PROCEDURES (ENTRY PROCEDURES)

A. Develop a Contingency Plan

The operation should follow a clear and concise course of action with a back up plan in place. The plan, (including hazard recognition, communication plan, Personal Protective Equipment (P.P.E.) as needed, and self-rescue techniques) shall be covered with entrant(s), back-up personnel, and attendants.

B. Entry and Exit

Each entry and exit point shall be evaluated to determine the most effective method for entry and egress travel distance. The entry/exit point selected shall have an attendant posted who shall note the time each entrant enters and exits.

C. Equipment

Determine what types of equipment are required to enter, retrieve the individual, and exit the confined space in the safest manner possible. Each rescuer shall use SCBA and be equipped with a radio, for communicating, while entering the confined space for rescue operations.

D. Hazard Evaluation

It shall be the responsibility of all "qualified persons" at the incident to identify potential hazards (including atmospheric testing). Any potential hazards identified shall be reported to the Safety Officer or Entry Supervisor ASAP. Hazards identified shall be evaluated by the Safety Officer or Entry Supervisor.

E. Isolation and Lockout/Tag Out

All energy sources which are potentially hazardous to the confined space entrant shall be secured, relieved, disconnected, and/or restrained before personnel are permitted to enter the confined space. Lockout/Tag Out of equipment, systems, and processes shall be confirmed and secured prior to permitting entry into the confined space.

F. Protective Clothing

1. Full turnouts including helmet, gloves, boots, etc., should be worn throughout the incident if conditions dictate.
2. On occasion full protective clothing may not be practical due to extremely limited working areas, warm temperatures, etc. In these situations entrants and back-up personnel shall wear Bump helmets, PBI coveralls or F.R. cotton wild land jacket and pants. This decision will be made by the Entry Supervisor and Incident Commander.
3. On other occasions, turnout gear will not provide adequate protection and encapsulated suits may be incorporated into the operation. This decision will also be made by the Entry Supervisor and Incident Commander.
4. Retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.
5. Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of entrant's back near shoulder level, or above the entrant's head.

G. Entry Permit

- An entry permit shall be generated when an employee enters a confined space that meets the criteria of Title 8, section 5157 (b). The employer shall retain each canceled permit for at least 1 year. The Entry Supervisor shall forward the canceled permit to the Operations Chief.