

**15.17 Scope:**

Historically, across our nation, many rescuers have lost their lives attempting to unsafely rescue other fatalities located in confined spaces. According to the Occupational Safety and Health Administration (OSHA) facilities and businesses that have confined spaces are required to provide on-site rescue capabilities. Our department shall only be called to assist private industry with rescue operations if they are performing their jobs properly. OSHA will thoroughly investigate all accidents in confined spaces, so it is imperative that operations be safely conducted and recorded. As an example, companies are required to have a retrieval device set up prior to conducting work in a confined space.

**15.1701 Definition:**

Confined spaces include caverns, pipes, tunnels, tanks, ventilation or exhaust shafts/vents, manholes, and other locations where ventilation and access are restricted by the configuration of the space. These factors may also apply to basements, cellars, crawl spaces, trenches or other similar areas.

**15.1702 Operations:**

Confined space operations shall comply with NFPA 1670 Chapter 7 Confined Space standards.

**15.1703 First Arriving Unit:**

The first arriving officer shall establish command and begin a size-up. Command shall then assess the situation and if not already dispatched, shall request assistance from a mutual-aid department. The request for mutual-aid will enable assistance with their confined space rescue teams.

Also, if EMS has not already been dispatched, at least one unit shall be requested to stand-by on the scene.

**15.1704 Size-up:**

Command shall make a careful size-up before deciding on an action plan. It may be necessary to take immediate action to make a rescue, but this should only be done if there is equipment available that limits the risk of Fire Department personnel.

**15.1705 Action Plan:**

Based on the initial size-up and any information available, Command will have to formulate an action plan to deal with the situation. Many times individuals will want action taken that could risk the lives of the rescue personnel.

The Action Plan should include the following:

- a. Isolate the scene and establish "Hot Zone" (working) 100' around access point, "Warm Zone" an additional 100' and "Cold" zone an additional 100'.
- b. Remove all "untrained rescuers" to the cold zone. This may require assistance from the Police Department.
- c. Find a responsible party or a witness to the accident.
- d. Locate the confined space entry permit or any other available information about the space.
- e. If possible, determine the number of victims and their potential location.
- f. Determine the length of time the victims have been down and their potential survivability.
- g. Determine if the situation is a rescue or recovery operation.

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- h. Determine what potential hazards are associated with the confined space involved (hazardous materials, low oxygen levels, engulfment hazards, etc.)
- i. Ensure that proper shutdown and lockout/tag out procedures are followed for the confined space involved. Assistance shall be requested from plant personnel in an industrial situation. See 4.49 for lockout/tag out procedures.

Only confine space trianed personnel are allow to enter the confine space. If the victim is attached to a body harness and retrieval line, the rescuers may lift the victim from the confined space area. Caution must be used if it is determined that the victim is viable and further injury may occur during the rescue. Conditions may allow further medical treatment be provided to the victim before removal from the confined space. A body harness, seat harness, or wristlets may be lowered to an uninjured or slightly injured victim for removal from the confined space.

**15.1706 Safety:**

Specific hazards to be aware of in a confined space:

- a. Possible oxygen deficiency or enrichment.
- b. Possible concentrations of flammable gas or vapors.
- c. Deficiencies in lighting.
- d. Very tight spaces.
- e. Temperature-heat.
- f. Unexpected ignition sources.
- g. Engulfment hazards.
- h. Energy sources (electric, steam, air, hydraulic).

To provide adequate support for confined space incidents, a minimum ratio of 2:1 personnel shall be provided. For every person working in the confined space, there shall be 2 personnel outside and available to assist.

A stand-by rescue team with a 1:1 ratio shall be provided for emergency assistance to the team working the confined space. This team shall be assembled and equipped for emergency response. The team shall be equipped with SCBA and ready to enter the confined space if needed.

The Incident Commander shall appoint a Safety Officer.

All personnel entering confined spaces shall use breathing apparatus unless it is determined through recognized air monitoring procedures that the space is free of hazards and sufficient oxygen levels are present. Either self-contained or airline supplied breathing apparatus may be used, depending on the situation. Personnel shall not remove face-pieces or take any other action to compromise the effectiveness of their breathing apparatus while inside the confined space atmosphere. The firefighters rescue harness must be worn under the SCBA. The free end of the lifeline shall be affixed outside the confined space in a manner to prevent it from being pulled inside.

Protective clothing shall be worn as required by the situation, depending on an evaluation of the hazards and the products that may be inside the confined space atmosphere.

When feasible, the Incident Commander shall establish Ventilation Group to begin operations directed at providing fresh air and/or exhausting contaminated air from the confined space. Any electrical or mechanical equipment taken inside the confined space, including lighting equipment, shall be an explosion proof type, when any flammable hazard is suspected. When ventilating a confined space containing flammable vapors or gases, ventilation shall consider the concentration in relation to the flammable limits.

Time awareness shall be maintained for each member in the confined space. Awareness of the expected exit time for each individual based on air supply at the time of entry shall be kept. A warning at the predetermined time shall be given to begin exit procedures. Warning will be provided by radio or other communication systems to team members.

Lifelines shall be used unless they cannot be safely used. The lifeline shall be tied to the firefighters rescue harness and not his/her breathing equipment.

**15.1707 Communications:**

The entry team(s) shall maintain constant radio communications with the Operations officer. Should radio communications fail or not be used, communication shall be maintained with the lifeline. The following rope signals shall be used to communicate basic messages:

- a. 1 pull on rope- O OK
- b. 2 pulls on rope- A Allow slack
- c. 3 pulls on rope- T Take up slack
- d. 4 pulls on rope- H Help

When using rope to communicate, remember the word O-A-T-H.

**15.1708 Post-Incident Analysis:**

All personnel that participated in the emergency shall be required to attend the post incident analysis.