

#### 4.18 Confined Space Rescue

Scope- Historically, across our nation, many rescuers have lost their lives attempting to unsafely rescue other fatalities located in confined spaces. Facilities and businesses that have confined spaces are required to provide on-site rescue capabilities according to OSHA. Our department should only be called to assist private industry with rescue operations if they are performing their job properly. OSHA will likely 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.

Definition- Confined spaces include, caverns, pipes, tunnels, tanks, ventilation or exhaust shafts/vents, 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.

Operations- A Hazard Assessment shall be performed on the confined space before entry is made. The Incident Commander may request an ambulance to stand by on the scene. Some of the equipment needed will include full protective clothing, hoisting equipment, lifelines, safety harnesses, air sampling devices, ventilation equipment and explosion proof lighting and electrical devices.

The officer in command shall assure that personnel entering a confined space do not commit themselves to travel within the space beyond a point that provides sufficient SCBA air reserve to return and exit safely, with at least a 5-minute safety margin. The time available for operations inside shall be estimated based on air supply and monitored by personnel outside, as well as the entry team.

Safety- Specific hazards to be aware of:

- Possible oxygen deficiency or enrichment

- Possible concentrations of flammable gas or vapors

- Deficiencies in lighting

- Very tight spaces

- Temperature - heat

- Unexpected ignition sources

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 in 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.

A safety officer shall be appointed by the officer in command.

All personnel entering confined spaces shall use breathing apparatus. Either self-contained or airline supplied 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 fire fighters rescue harness must be worn under the SCBA. The free end of the lifeline shall be affixed outside the confined space in

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 which may be inside the confined space atmosphere.

When feasible, the officer in command should establish a Ventilation Sector 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 must 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 will be given to begin exit procedures. Warning will be provided by radio or other communication systems to team members.

If lifelines are to be used, the lifeline shall be tied to the fire fighter and not his breathing equipment. The lifeline shall be tied using a chimney hitch knot.

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

1 pull on rope -O OK

2 pulls on rope -A Allow slack

3 pulls on rope -T Take up slack

4 pulls on rope- H Help

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

Post-Incident Report- Have all personnel involved, document their observations and actions on the fire report or a supplemental report.