



Rogers Fire Department Standard Operating Procedures

Policy Title:	Confined Space Rescue		
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PURPOSE

The purpose of this policy is to provide guidelines to be used by rescue personnel conducting a confined space rescue. Rescue personnel must use judgment, experience, and training to adapt to the specific situation.

POLICY

According to federal regulations and standards, the on-duty component of the Rogers Fire Department's Special Operations Team (SOT) shall act and perform as the city's rope rescue response unit and provide:

- Technical expertise
- Assistance
- Appropriate equipment
- Response for the protection of life, property, and the environment

In addition all Field Operations personnel will be trained to support this effort.

Definitions

A confined space is any space which is not intended for continual occupancy, has limited means of egress, and has the potential for physical, chemical, or atmospheric engulfment.

In addition to the general definition of confined space there is also two types of confined spaces; permitted and non-permitted.

Note: For the purpose of rescue, all confined spaces will be treated as permit required.

Permit Required Confined Space

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

- Contains or has the potential to contain a hazardous atmosphere.
- Contains or has known potential to contain hazardous atmosphere.
- Contains material with potential for engulfing an entrant.
- Has internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor that slopes downward and tapers to a smaller cross section.
- Contains any other recognized serious safety or health hazard.

Non-Permit Required Confined Space

A non-permitted required confined space meets the following description:

- A non-permitted confined space does not contain or with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.
- In this space, it is unlikely that an Immediately Dangerous to Life or Health (IDLH) or engulfment hazard would be present and all other serious hazards have been controlled.
- The facility safety officer develops monitoring and inspection data that supports that the only hazard is an actual or potential hazardous atmosphere and that forced air ventilation alone is sufficient to maintain that alternate permit space.
- If initial entry by personnel is necessary to determine the atmospheric conditions the entry shall be performed as a permitted confined space entry.

Confined Space Rescue Assignment

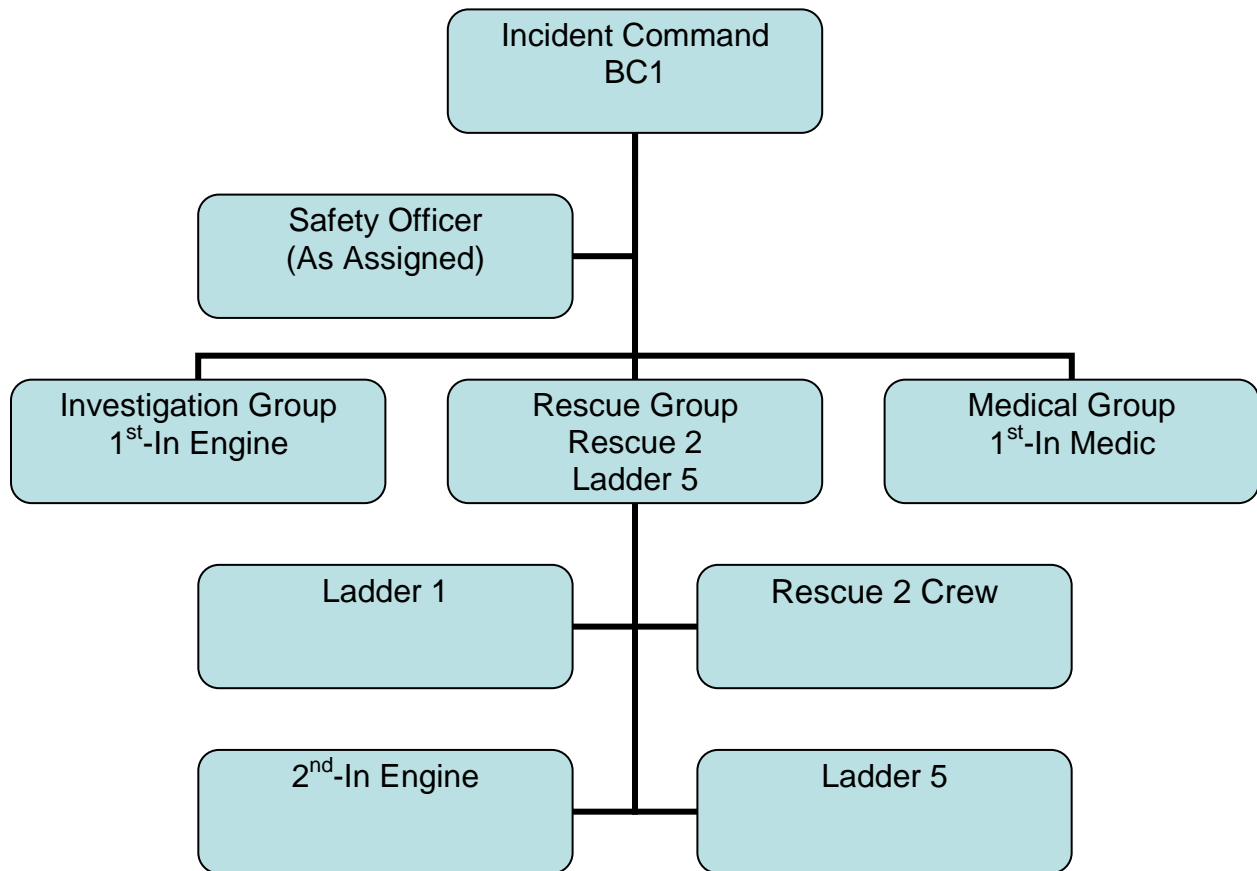
The City Wide Tour Commander (CWTC) shall evaluate incidents dispatched that may have the potential of being a confined space rescue incident. Besides the CWTC, any company officer may call for technical rescue response for a call that requires the expertise and equipment contained within this policy. The assignment for a confined space rescue inside the city includes the following:

- 2 Closest Fire Companies
- Closest Medic Unit
- Ladder 1
- Ladder 5
- Rescue 2
- Battalion 1

The standing orders for these first alarm companies are as follows:

- 1st-In Engine Company: Establish Investigation Group. Perform scene assessment, immediate control actions, and locate witnesses and maintenance personnel.
- 2nd-In Engine Company: Report to Rescue Group. Be prepared to perform support/supply functions.
- Medic Unit: Establish Medical Group
- Ladder 1: Report to Rescue Group. Be prepared to perform rigging functions.
- Ladder 5 & Rescue 2: Establish Rescue Group. Crew should be prepared to perform victim rescue/recovery functions.
- Battalion 1: Incident Command

All technical rescue incidents shall have a structured intervention system. This system, under NIMS, shall be group based and have the responsibilities listed in this document. In large multi-strategy incidents, a technical rescue branch may be enacted. Most incidents will involve an ICS setup similar to the chart below.



Phase I: Scene Preparation

1. Assessment

Upon arrival at a confined space incident the following information should be obtained:

- Type of confined space.
- Presence of product storage hazards.
- Locate the job site foreman or a reliable witness.
- Location and number of victims (Make verbal contact as soon as possible).
- Blue prints, maps, or sketches of the site.
- Mechanisms of entrapment or nature of illness.
- Number of entry points and locations.
- Electrical/mechanical/chemical hazards.
- Determine early the need of mutual aid from additional Technical Rescue Teams.

2. Safety

1. Establish a secure perimeter around the hazard area.
2. Ventilate the general area, if needed as determined by air monitoring equipment.
3. Ventilate the space. Continually assess the effectiveness of your ventilation process by:
 - i. Atmospheric monitor readings
 - ii. Assessment of type and configuration of the space
4. If possible, open all additional openings in the space to assist with the ventilation process while assuring problems such as recirculation, short circuiting, chimney effect etc. are not occurring.
5. Assure fire control measures, if needed.
6. Eliminate all sources of ignition on-site.

Phase II: Entry Preparation

Unit Assignments for Confined Space Rescue

The Rescue Group Supervisor shall be responsible for assigning:

1. A crew to perform rigging functions (Preferably Ladder 1)
2. A crew to perform the victim rescue/recovery function (Preferably Rescue 5 and Ladder 5 crew)
3. A crew to perform support/supply functions (Preferably the 2nd-In Engine)

The Rescue Group Supervisor shall be responsible for preparing a Confined Space Rescue documentation sheet.

The rigging crew is responsible for the following actions: rigging, belaying, rope minding, etc.

The rescue/recovery crew is responsible for making entry to locate and remove the victim.

The support/supply crew is responsible for ensuring that both the rigging crew and rescue/recovery crew have all necessary equipment.

Personnel should be assigned to perform air monitoring in the area of the confined space. Typically this will be done by personnel entering into the confined space; however on large complex incidents this may require the establishment of an Air Monitoring Group. Air monitoring should be performed for the following conditions:

- Oxygen-deficiency: less than 19.5% oxygen
- Oxygen-enrichment: greater than 23.5% oxygen
- Combustible Gases and Vapors (LEL): any atmosphere containing over 10% of lower explosive limit presents an explosion or fire hazard
- Toxicity: Carbon Monoxide over 35 ppm or Hydrogen Sulfide over 10 ppm

All atmospheric readings shall be recorded on a confined space rescue worksheet.

All Rescue Group members will be fully briefed on their assignments after the Rescue Group Supervisor has consulted with the IC, a rescue plan has been formulated, and prior to the commencement of rescue operations. If the situation permits, a backup plan should be in place.

The following actions should be taken prior to entry into the confined space:

1. Assure lock out, tag out, blank out procedures are complete.
 - All fixed mechanical devices and equipment capable of causing injury shall be placed in a zero mechanical state (ZMS).
 - All electrical equipment (excluding lighting) shall be locked out in the open (off) position with a key type padlock.
 - The key shall remain with the person who places the lock on the equipment.
 - In cases where lock out is not possible, equipment shall be properly tagged and physical security provided.
2. Post non-essential personnel at those areas tagged and blanked or blinded.
3. Assure that all personnel who enter the site are equipped with proper PPE and SABA or SCBA.
4. All entry personnel will have their vitals taken and recorded prior to entry if time permits.

5. Assure one (1) backup team for every entry team.
6. As a general rule personnel should enter confined spaces in teams of two, however some situations may require that a lone rescuer enter. Constant communication should be maintained with the entry personnel.
7. No team shall enter a space with pagers or other "non-intrinsically safe devices" unless approved prior to entry, based on atmospheric monitoring.
8. Each entry team shall be equipped with the following items:
 - At least one member shall have an intrinsically safe radio.
 - Explosion proof lighting, volume or other explosion proof light.
 - Atmospheric 4 gas monitor.
 - Proper protective gear as deemed necessary by the incident commander. At the very least each member shall wear boots, gloves and helmet, and a Pass device.
 - An entry/egress line shall accompany the first entry team and be anchored at their furthest point of penetration.
 - Some form of rapid extrication/retrieval harness for a victim.
 - If the entry team must enter a vertical shaft of greater than eight feet, each member shall wear a personal harness and be attached to a fall arresting system upon entering. (Class III)
 - A victim SABA and supply line or SCBA, if applicable.

Phase III: Entry

Once the best method and location for entry has been determined, teams shall begin entry and reconnaissance/rescue/recovery operations in the space. A log shall be maintained noting the entry times of all personnel.

Entry decisions shall be made based on known locations of victims, safety of the opening, atmospheric readings and ease of recovery points.

If possible, attempt a two-prong attack to reach the victim(s) if their location is known or suspected.

Teams shall be limited to 30 minutes in any space to include entry and egress.

Each team shall be assigned to rehab upon removal from the space until re-hydrated and vital signs are within normal limits.

Once inside the space:

- Assure adequate interior team communications.

- Assure adequate communications with the entry supervisor. IF visual/voice communication is not possible, rescue members should use OATH.
 - O-OK (1 pull on rope)
 - A-Advance (2 pulls on rope)
 - T-Take up slack (3 pulls on rope)
 - H-Help (4 pulls on rope)
- Mark, if necessary, with chalk, cylumes or other method, entry and movement patterns to assure egress.
- Move towards the suspected victim location as a team. (Beware of elevation differences and unstable footing.)

Once the victim has been located, decide:

- Is this a rescue or recovery?
- If rescue, can a SABA or SCBA unit be placed on the victim?
- Can the victim be easily moved towards the opening with current equipment carried by the team?
- Is an additional team needed to make the move?

Communicate your decision/needs to the Incident Commander.

If the victim is to be moved through an opening which represents the only way out of the space, all team members should be stationed to the egress side of the hole/opening in case the victim becomes lodged. Always try to avoid being **blocked in** by a victim. If this is not possible, assure the following:

- When the move is made, assure it is made quickly and smoothly, leaving the time the space is blocked for egress as minimal as possible.
- Assure that the exterior personnel, as well as interior teams, are aware of the move and a plan is agreed upon prior to blocking the space.
- Assure that all air lines and connections are clear of the victim and his movement path to assure that no air line problems develop as a result of the victim becoming entangled or pinching off the lines.

Phase IV: Victim Removal

Once the victim is set for removal, assure the following:

- Attempt to maintain c-spine control if possible based on the space and the victim's condition.
- Use removal systems on the exterior that are applicable to the size and weight of the victim.
- Mechanical advantage systems are much preferred over manual hauling.
- Do not use electric winches, etc., to remove victims.
- Decide if the victim is to be removed head first or feet first.

- Avoid the use of wristlets on patients with burns to the extremities.

Once the victim is clear from the space, remove all entry team personnel and equipment.