

Hurricane Fire & Rescue Hurricane, WV Operation Guidelines

Subject
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Confined Space
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6

Purpose: To establish guidelines for operating at confined space incidents.

Scope: Emergency Personnel

Responsibility: It is the responsibility of the all emergency personnel to adhere to this policy.

INTRODUCTION

Confined spaces present one of the most dangerous environments fire service personnel may confront. In accordance with OSHA statistics, 70 percent of all fatalities associated with confined space operations are “rescuers.” In an effort to minimize risk to both personnel and victims, these guidelines are established for entry and rescue into a confined space.

Confined spaces are defined as “those areas which are not intended for continual employee occupancy; have a limited means of egress; and have the potential for physical, chemical, or atmospheric engulfment.” This procedure is presented in seven phases to provide guidelines for personnel to use when performing a confined space entry and rescue.

PHASE I: SCENE PREPARATION

Upon arrival at an incident involving a “confined space” rescue, the first arriving unit should obtain the following information from the job site foreman and be prepared to affect special operations callback and/or mutual aid personnel as required.

Step One, Assessment

- * Type of space?
- * Are there product storage hazards?
- * Locate and secure the job site foreman or a reliable witness.
- * Determine location and number of victims.
- * Obtain blue prints, maps, or have on-site personnel draw a sketch of the site.
- * Determine the mechanisms of entrapment or nature of illness.
- * Make a conscious decision as to whether this is a “rescue” or “recovery.”
- * Determine the number of entry points and locations.
- * Determine electrical/mechanical chemical hazards.

Step Two, Personnel and Equipment

- * Assure needed response of additional personnel as required.
- * Dispatch additional equipment to the scene.
- * Assure a full Engine Company response is assigned.
- * Assure at least one Medic Unit.
- * Assure sufficient rehab area is established.
- * Assure visible incident command and/or operations section is established.

Step Three, Make the General Area Safe

- * Establish perimeter with tape and assign law enforcement to assure an access point.
- * Ventilate the general area if needed.
- * Ventilate the space with positive pressure. There may be times when positive pressure will not work as needed. Continually assess the effectiveness of ventilation process by: (a) atmospheric monitor readings, (b) assessment of type of configuration of the space.
- * If possible, open all additional openings into the space to assist with the ventilation process: (a) manholes, (b) hatches, (c) natural openings.
- * Assure fire control measures, if needed.
- * Do not allow sources of ignition on site.

PHASE II: ENTRY PREPARATION

- * Assure lock-out, tag-out, procedures are complete.
 - a. All fixed mechanical devices and equipment capable of causing injury will be placed in a zero mechanical state.
 - b. All electrical equipment (excluding lighting) will be locked out in the open (off) position with a key type padlock.
 - c. The key will remain with the person who places his/her lock on the padlock.
 - d. In cases where lock-out is not possible, equipment will be properly tagged and physical security provided.
 - e. All lock-out utilities will also be tagged with an approved Confined Space Tag system.

- * Post non-essential personnel at those areas which cannot be locked-out, tagged-out.
- * Assure that all personnel who will enter the site are equipped with SABA (supplied air breathing apparatus). If the standard SCBA must be removed to fit in the opening or moved into the space, DO NOT ENTER! If a standard SCBA is used to enter, go no more than 25 feet from the entrance. Entrance with standard SCBA should be limited to reconnaissance only unless the victim is easily accessible.
- * Assure one backup team for each entry team.
- * No one will enter a confined space alone; always in teams of two as a minimum.
- * No team will enter a space with pagers or other "intrinsically unsafe devices" unless approved prior to entry, based on atmospheric monitoring.
- * Each entry team will be equipped with the following items.
 - a. One member will have a communications, sound powered, system in place; worn with the SCBA.
 - b. Explosion proof lighting, cylume, or explosion proof light.
 - c. Atmospheric monitor.
 - d. Proper protective gear as deemed necessary by the Incident Commander.
 - e. An entry/egress line will accompany the first entry team and be anchored, at their furthest point of penetration.
 - f. Some form of rapid extrication/retrieval harness for a victim.
 - g. If the entry team must enter a vertical shaft of greater than eight feet, each member will wear a personal harness and be attached to a fall-arresting system upon entering.

PHASE III: ATMOSPHERIC MONITORING

- * Atmospheric monitoring will occur prior to and during all entries into a confined space. It should be stressed that the lack of positive or alarm level readings does not eliminate the requirement for proper respiratory protection.
- * Atmospheric monitoring should be accomplished at high and low areas of the space.
- * All atmospheres will be tested for:
 - a. Oxygen deficiency
 - b. Oxygen excess
 - c. Toxicity
 - d. Flammability
- * The following levels will be considered as immediately dangerous to life and health (IDLH) environments:
 - a. Oxygen deficient < 19.5%
 - b. Oxygen enriched > 23.0%
 - c. Flammability at 10% of Lower Flammable Limit (LEL)
 - d. Toxicity will be any limit with numerical value exceeding the Permissible Exposure Limit (PEL) in accordance with the table.
- * Atmospheric monitoring will occur during occupancy at intervals dependent on the possibility of changing conditions, but in no case less than hourly.
- * When, in the opinion of the Incident Command, the atmospheric readings become unsafe to continue operations, all entry teams will be removed from the space immediately until such time as the atmospheric conditions are corrected.

PHASE IV: ENTRY

- * Once the best method and location for entry has been determined, teams will begin entry and reconnaissance/rescue/recovery operations in the space.
- * Entry decisions will be made based on known locations of victims, safety of the opening, atmospheric readings, and ease of recovery points.
- * Prior to entry, team members will be logged on a technical rescue worksheet with their time of entry. This function will be assigned to the Entry Team Leader who will keep the Incident Commander apprised of the status of each team.
- * Teams will be limited to thirty minutes in any space.
- * Each team will be assigned to rehab upon removal from the space until re-hydrated and vital signs are within normal limits.
- * Once inside the space:
 - a. Assure adequate interior team communications
 - b. Assure adequate communications with the operations exterior.

- c. Mark, if necessary, with chalk, cylumes, or other method, entry and movement patterns to assure egress.
 - d. Move towards the suspected victim location as a team.
 - e. Beware of elevation differences and unstable footing.
- * Once the victim has been located, decide:
 - a. If this is a rescue or recovery.
 - b. If a rescue, can a SABA unit be placed on the victim?
 - c. Can the victim be easily moved towards the opening with current equipment carried by the team?
 - d. Is an additional team needed to make the move?
 - e. Communicate your decision to the outside command.
- * Once the victim has been attached to a removal device and is in the process of being rescued/recovered, assure that when the victim is moved through the opening, which presents team members the only way out, either vertical or horizontal, that the following guidelines are followed.
 - a. Whenever possible, assure that all team members are stationed to the egress side of the opening in the event the victim becomes lodged.
 - b. Always try to avoid being blocked in by a victim.
 - c. If this is not possible, assure the following:
 - 1. 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.
 - 2. Assure that exterior personnel as well as interior teams are made aware of the move and a plan is agreed upon prior to blocking the space.
 - 3. 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 V: VICTIM REMOVAL

- * Once the victim is set for removal, assure the following:
 - a. As much c-spine control as possible should be considered based upon the space and the victim's condition.
 - b. Use removal systems on the exterior, which are applicable to the size and weight of the victim.
 - c. Mechanical advantage systems are much preferred over manual hauling.
 - d. Do not use electric winches, etc., to remove victims; these allow little control and could result in dismemberment or additional injury.
 - e. Decide if the victim is to be removed head first or feet first.

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

PHASE VI: SAFETY CONSIDERATIONS

- * If rigging, hauling, or use of rope hardware is needed in a space, assure only aluminum carabineers and hardware are used to avoid sparks.
- * In the event of an airline failure on a SABA, the entire team will IMMEDIATELY leave the space and assure that the rescuer with the problem is assisted.
 - a. Notify the exterior immediately of the problem and identify the line and the specific problem.
 - b. Never leave a partner in trouble unless clearing the way for the exit.
 - c. In the event that the 10-minute bypass bottle runs out before you have exited and the airline problem has not been corrected:
 1. Buddy breathing bypassing the mainline (which is still functional) back and forth to each other's system is acceptable.
 2. Do not leave the non-operational line behind.
 3. Exit the space and correct the problem.

PHASE VII: TERMINATION

- * Double check personnel list and assure all personnel are accounted for.
- * Inventory and replace all equipment.
- * Place any equipment, which has been damaged or potentially unfit for further confined space use out of service until repaired.
- * Have the contractor or responsible party seal all entry points to assure no additional entry may be made.