



Training Standard

North County Technical Rescue Team

TOPIC:

Confined Space Operations

PURPOSE:

The purpose of this training standard is to establish guidelines for conducting confined space rescue operations. Confined spaces include caverns, tunnels, pipes, tanks, and any other locations where ventilation and access are restricted by the configuration of the space. Confined space incidents may involve injured persons, persons asphyxiated or overcome by toxic substances, cave-ins or fires occurring within the space.

DEFINITION:

- **Immediately Dangerous to Life and Health (IDLH):** A condition that will or may affect the health and safety of an individual. Exposure time may vary between acute and prolonged.
- **Permit:** Paperwork detailing the current hazards in the space, potential hazards, safety considerations, mitigation techniques, rescue procedures, and personnel authorizing actions in and around the space. A written permit is required prior to an individual entering a space when a hazard has the potential to be IDLH. Approved by Rescue Group Supervisor, Safety Officer and Incident Commander.
- **Atmospheric Hazard Testing Sequence:** All atmospheric hazards will be tested for (1) oxygen level, (2) Flammability, and then (3) Toxicity. Failure to test in correct sequence may result in inaccurate readings.



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- **Audible & Visual Alarm Settings:** All testing instrumentation will have audible and visual alarm settings for: Oxygen (O₂) low 19.5 %, enriched 23.5 %, Flammability (LEL) 10 % , Carbon Monoxide (CO) 25 ppm, Hydrogen Sulfide (H₂S) 10 ppm
- **Ventilation Equipment:** Intrinsically safe fans, ducting, atmospheric detector to monitor exhaust, power supply
- **Breathing Air Equipment:** Air Cart, hoses, masks, supplied air respirators, SCBA, cache of spare bottles
- **Lock Out, Tag Out, Black Out:** Procedures that are completed to secure hazards from affecting the confined space or from affecting the personnel that are inside the space. Must remain secure throughout the entire incident.
- **Rescue Group Supervisor:** Must be trained and versed in Confined Space Rescue. Responsible for all rescue operations that are conducted during the incident. Advises Incident Commander of actions taken to affect rescue. Conducts Pre Entry Briefing for all personnel prior to entry into the space.
- **Safety Officer:** Must be trained and versed in Confined Space Rescue. Responsible for all safety considerations for personnel on rescue incident. Will coordinate all operations with the Incident Commander.
- **Attendant:** Must be trained and versed in Confined Space Rescue. Responsible for coordinating all actions in and directly around the confined space while personnel are inside the hazard area. Maintains a continuous communication link with all rescue personnel. Advises Rescue Group Supervisor of all actions being conducted.



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- **Rescuer/Back Up Personnel:** Must be capable of completing assigned rescue task. Will communicate directly with the Attendant. Must wear appropriate personal protective equipment for the hazards present.
- **Pre Entry Briefing:** Communication from Rescue Group Supervisor summarizing: Initial situation found, Current situation- Victim count/location, confined space configuration, Strategy and tactics- Rescue or recovery, Hazards present- Safety concerns, exposure potential, air monitoring report, Mitigation techniques, Lockout/Tagout/Blackout, Emergency Operations. Will be completed prior to personnel entering into the space.

TACTICAL CONSIDERATIONS:



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I. Assessment

A. The Primary Assessment

1. Establish Command
2. Determine Staging Area for incoming resources
3. Assess present hazards
4. Locate the reporting party or witness and obtain:
 - (a) Number of victims
 - (b) Location(s) of victim(s)
 - (c) Estimated down time of victims
 - (d) Mechanism of injury
 - (e) Reason for entering the space
5. Establish communications with the victim as soon as possible

B. The Secondary Assessment

1. Identify the hazard in the space
 - (a) Electrical
 - (b) Mechanical
 - (c) Toxic gases
 - (d) Oxygen levels
 - (e) Flammability
 - (f) Radioactive materials
 - (g) Engulfment potential
 - (h) Dust/visibility
 - (i) Extreme temperature
 - (j) Biological
2. Identify the type of products that are stored in the space



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3. Assess stability of the space
4. Diagram the confined space, labeling:
 - (a) Overall space configuration
 - (b) Entry and egress point and routes
 - (c) Location and number of victims
 - (d) Location of pipes, hoses, wires, machinery and any other potential hazards
5. Assess on-scene personnel and equipment
 - (a) 8-10 trained personnel on-scene to affect a rescue operation
6. Documentation
 - (i) Secure any permit information from the scene and begin a new permit for rescue operations

II. Pre-Entry Operations

A. Make the general area safe for operation

1. Assign Rescue Group Supervisor
2. Establish perimeters
 - (a) The size of the perimeter will be dictated by the atmospheric conditions, wind direction, structural stability, rescue scene needs
 - (b) Enforce with police officers or security
3. Assign Safety Officer

B. Make the rescue area safe for operation

1. Establish Air Monitoring and Equipment
 - (a) Tests will be done in the correct sequence
 - (b) Based on readings, the Air Monitoring will assist with determining the proper level of personal protective equipment



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Note: Any O₂ readings below 12%, all personnel should recognize that the LEL reading will not be accurate.

- (c) Air Monitoring should give the Rescue Group Supervisor readings every 5 minutes
- 2. Establish Ventilation and Equipment
 - (a) Ventilation should consult with Air Monitoring and Rescue Group Supervisor to determine the proper ventilation technique
 - (i) Ventilation must always monitor the exhaust from the space, and consider any effects it may have on the operation

Note: The Air Monitoring and the Ventilation are extremely important to the overall safety of the incident. They should be established early and be comprised of personnel that have a thorough knowledge of atmospheric monitoring and ventilation techniques.



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- (b) Perform any needed Lockout/Tagout/Blackout
 - (i) Electrical
 - (ii) Natural gas
 - (iii) Water
 - (iv) Sewage
 - (v) Oil
 - (vi) Machinery
 - (c) If it is not possible to Lockout/Tagout/Blackout, the Safety Officer will post a guard to assure the utilities are not turned on during the operation
3. Assign Rehab
 4. Rescue Operation
 - (a) Obtain Communication Equipment
 - (b) Establish Rigging and Equipment
 - (i) Construct a minimum of a 2:1 mechanical advantage system
 - (ii) Construct and staff a Belay (safety) line
 - (iii) Construct a fall protection system for rescuers
 - (iv) Secure high point attachment and anchor locations
 - (c) Establish Breathing Air and Equipment
 - (i) Rescuers will wear supplied air respirators when:
 - Atmospheric conditions require full respiratory protection
 - Estimated time in the space will exceed half of the capacity of the SCBA air cylinder



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- There is a need to decrease the profile of the rescuer for entering and exiting the space
- (ii) Rescue Group Supervisor may authorize entry without breathing protection if there is not an atmospheric hazard present, or there is not the potential for an atmospheric hazard to be present during the operation
- (d) Assign Attendant
- (e) Assign Rescue Team
 - (i) Minimum of two person teams
 - (ii) If time permits, medical monitoring will occur prior to entry
 - (iii) Personal protective equipment will be appropriate for the hazards present in the space and will always include a full body harness
- (f) Assign Back Up Team
 - (i) Personnel will meet or exceed the level of training and personal protective equipment of the Rescue Team
- (g) Conduct Pre Entry Briefing
 - (i) Involves all group leaders/supervisors
 - (ii) Will be documented by the Rescue Group Supervisor

III. Entry/Rescue Operations

A. System Check all personnel and equipment

B. Assure proper communication and lighting

1. There will always be a primary and secondary means of lighting and communication while in the space



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Note: While inside the confined space, if the rescuer determines that the “tag-line” is a danger to themselves and/or others, they may elect to remove it and proceed without. This decision must be communicated to the Attendant. The rescuer will reattach to the line as soon as possible.



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C. Victim treatment and removal

1. Assess the level of consciousness
2. Determine chief complaint
3. Treat immediate life threatening injuries
4. Perform appropriate and necessary interventions
5. Package in appropriate device for extrication

D. Transfer to Medical Unit

1. Consider decontamination prior to transfer

IV. Termination

A. Preparation for termination

1. Personnel accountability
2. In the event of a fatality or serious injury
 - (a) Leave all equipment in place
 - (b) Contact OSHA representative and have them respond to scene

B. Decontaminate all equipment and place back in service

C. Turn secured property back over to the responsible party

D. Terminate Command

1. Consider debriefing for rescue personnel

E. Documentation

1. Permit
 - (a) Close out permit and keep to attach to records
2. The following personnel should complete an ICS 214:
 - (a) Incident Commander
 - (b) Safety Officer



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- (c) Operation Chief (if applicable)
 - (d) Rescue Group Supervisor
3. Reporting
 - (a) Incident Commander is responsible for entering the report into the appropriate reporting database
 4. Package all paperwork together for investigation
 5. Keep paperwork on file for at least 2 years from the time of the incident