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**Ames Fire Department  
Standard Operating Guidelines**

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Book: 3 - Emergency Operations  
Section: VII – Rescue Operations  
Chapter: 1 – **Confined Space Rescue**  
Date Approved: 09-02-2008 Revision No. 3 Approved by: 

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**PURPOSE:**

Provide direction during entry and rescue operations in a confined space.

**POLICY:**

The Ames Fire Department shall assume command and control of any incident involving confined space entry for rescue in the City of Ames or ISU facilities. Thus, a thorough knowledge and understanding of the roles, responsibilities, and challenges of performing confined space rescue is essential.

**PROCEDURE:**

**Dispatch, Personnel, and Equipment**

- “Person trapped” response: T3, HM2, C1, Rescue 2 ( minimum 9 personnel ) & confirmation of dispatch of Advanced Life Support Unit
- Establish Command upon arrival
- Establish Safety Officer, staging, medical, and rehab areas
- Notify the Fire Chief or designee

**Size-up and Assessment**

Prior to operations and following establishment of command, the first arriving unit shall attempt to address the following:

- What type of space is it?
- Are there any residual hazardous products present? Obtain MSDS.
- Locate and secure the responsible job supervisor or reliable witness.
- Determine the location and number of victim(s).
- Obtain blue prints, maps, or have on site personnel draw a sketch of the site.
- Determine the mechanisms of entrapment or injury.
- Make a conscious decision as to rescue, or recovery.
- Determine number and location of entry/exit points.
- Determine electrical, mechanical, or other hazards.
- Assign aide or scribe to start documentation records.
- Assign Rescue Team personnel responsibilities.
- Request “Call Back” from APD dispatch if needed.
- Determine need for additional Advance Life Support (ALS) Ambulance on scene for rescuers, and victims.

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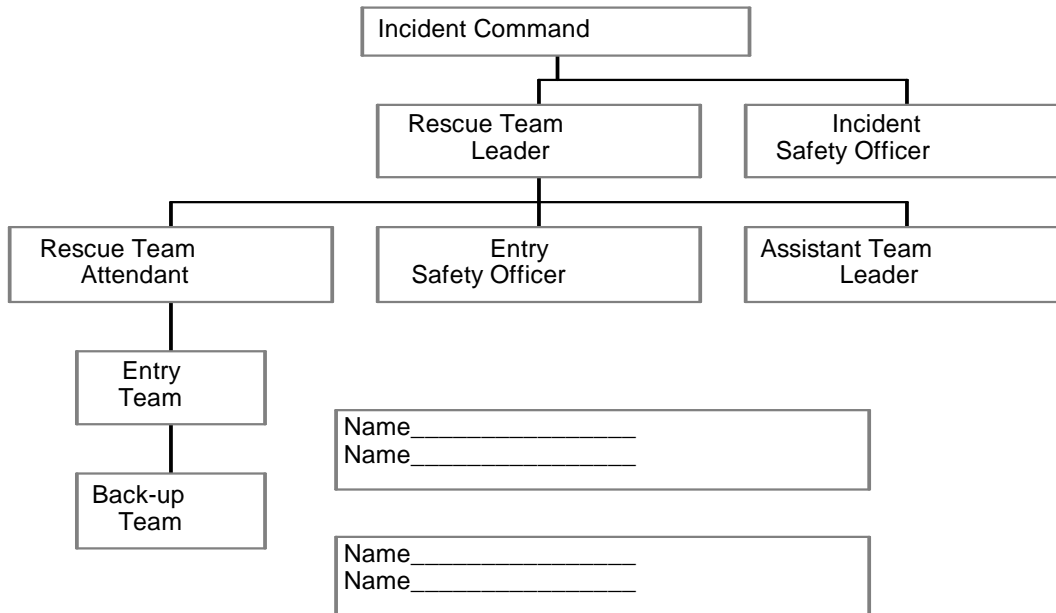
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**Rescue Team Personnel Assignments**

- Rescue Team Leader (RTL)
  - Responsible for confined space operations
  - Reports to IC
- Entry Safety Officer
  - Responsible for accountability, air supply, and general safety
  - Reports to RTL
- Assistant Team Leader
  - Responsible for atmospheric testing, and ventilation
  - Reports to RTL
- Rescue Team Attendant (RTA)
  - Responsible for entry and back-up teams, tag line attendant
  - Reports to RTL
- Entry Team – Minimum 2 members
  - Responsible for operations tasks
  - Reports to RTA
- Back-up Team – Minimum 2 members
  - Responsible for operations tasks
  - Reports to RTA



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**Phase One: Pre-entry Operations**

- Establish a perimeter with tape or other means to maintain a safe work area.
- Ventilate the general area, if necessary.
- Ventilation of confined space
  - Ventilation efforts should be continuously evaluated by atmospheric monitoring.
  - This information will provide clues as to the efficiency of your ventilation program and will allow you to make adjustments.
- Eliminate all potential ignition sources.
- Assure lock out tag out and blank out procedures are completed.
  - All mechanical devices and equipment capable of causing injury shall be placed in a zero mechanical state.
  - All electrical (excluding lights) shall be locked out in the off position with keyed padlock (key is to remain with IC).
  - In cases where lockout is not possible, equipment shall be tagged and a physical security provided.
- Post non-essential personnel at those areas tagged, blanked, or locked.
- If you must remove your self contained breathing apparatus (SCBA) to fit in the opening or move in the space – *do not enter!*
  - If you can safely enter with SCBA go no further than 25 ft. or direct line of sight.
  - Entry with a standard SCBA should be limited to reconnaissance only, unless the victim is easily accessible.
- Have a back up team in place with a minimum of two personnel.
- No one shall enter a confined space alone, always work as a team.
- Only approved intrinsically safe devices will be used.
- Each entry team should be equipped with the following:
  - One member maintaining communications with attendant.
  - Explosion proof lighting, (i.e., cylume stick)
  - An appropriate atmospheric monitor
  - Proper protective gear, as deemed necessary by IC
  - A tag line accompanying the first entry team, anchored at their furthest point of penetration (to the victim)
  - A life line/retrieval line for the first-in entry team
  - A form of rapid extrication harness for the victim
  - In vertical shafts greater than 5 feet, entry team members must enter wearing a personal harness, and attachment to a fall arrest system should be made prior to entry

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- A victim SABA or SCBA should be a consideration, if equipment is available.

**Phase Two: Atmospheric Monitoring**

Atmospheric monitoring shall 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 done at high and low areas of the confined space.
- Atmospheres require testing for:
  - Oxygen-deficiency
  - Oxygen-enrichment
  - Toxicity levels
  - Flammability levels
- The following levels shall be considered as immediately dangerous to life and health (IDLH):
  - Oxygen deficient < 19.5 %
  - Oxygen enriched > 23.5%
  - Flammability at or above 10% of the Lower Explosive Limits (LEL)
  - Toxicity shall be any limit whose numerical value exceeds the Permissible Exposure Limit (PEL)
  - Entry can continue if proper Respiratory Protection and PPE are used, as determined by the Incident Commander.
- Atmospheric monitoring shall occur during occupancy (entry and rescue operations) at intervals dependent on the possibility of changing conditions, but not less than hourly.
- Atmospheric readings are to be recorded and evaluated.
- During entry operations, it is recommended to take monitor readings every 10 feet vertically and every 15 feet horizontally.

*In the event that the readings indicate an unsafe or unacceptable condition, the Incident Commander or Safety Officer should remove all entry teams immediately. Emergency operations may continue once the unsafe condition is corrected.*

**Phase Three: Entry and Rescue Operations**

- Once the safest method and location for entry has been determined, teams may begin entry and reconnaissance/rescue/recovery operations.
- Entry decisions are best made based on known location of victims, safety of the opening, atmospheric readings, and ease of recovery points.
- The RTA records the time of entry of each team member.
- Teams will be limited to thirty (30) minutes in any confined space.

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- Each team will be assigned to rehab upon removal from the confined space, until re-hydrated and vital signs are within normal limits, as determined by the Rehab Section Leader.
- For entry into the confined space:
  - Assure adequate interior team communications
  - Assure adequate communication with the RTA
  - Mark, if necessary, movement patterns to assist in egress (i.e., chalk, cylume sticks)
  - Move toward the reported victim(s) last known location as a team
  - Be aware of elevation differences and unstable footing
- Once victim is located:
  - Determine rescue or body recovery (ABC's)
  - Place SABA/SCBA on victim (with positive ABC's)
  - If additional equipment/ staffing is needed, make request through the RTA

**Phase Four: Victim Removal**

- Place victim on/in proper extrication device.
- Protect for cervical spine injuries, if mechanism of injury warrants.
- If applicable, attach haul line to extrication device and victim when possible.
- Haul systems operated from the outside are preferred.
- Electric winches should never be used to remove victims.
- *Avoid being blocked in by victim*, keep rescuers between the opening and the victim.
- In the event of an airline failure or breathing air problem, both team members shall immediately leave the confined space.
  - Immediately notify the RTA of the problem
  - Never leave your partner, unless it's to clear a pathway to exit
- Do not disconnect a "non-functional" supplied airline; it may potentially be restored from the outside.

**Phase Five: Termination**

- Assure ALL personnel are accounted for.
- Complete equipment inventory.
- Secure confined space.
- Release to appropriate authority.
- Assure that IOSHA is notified of incident.