

Confined Space Entry

San José State University

Environmental Health and Safety

Facilities Development & Operations



Confined Space Entry.

1. What is Confined Space Entry?
2. Types of Confined Spaces.
3. Why Confined Space Entry?
 - Case Studies
4. What are the regulatory requirements in California?
5. What are the Key Elements of Confined Space Entry?
 - Types of Confined Spaces.
 - Confined Space Hazards.
 - Hazard Controls.
 - Identification and Classification of Confined Spaces.
 - Entry Permits and Procedures.
 - Roles and Responsibilities.
 - Training.
 - Outside Emergency Rescue Services.
6. Definitions.
7. Demonstration of Confined Space Entry.

What is a Confined Space?

A Confined Space...

1. Is large enough and so configured that an employee can bodily enter and perform assigned work; AND
2. Has limited or restricted means for entry or exit; AND
3. Is not designed for continuous occupancy by the employee.



These spaces may include, but are not limited to...

1. underground vaults,
2. tanks,
3. storage bins, tubs,
4. pits and diked areas,
5. vessels,
6. boilers
7. ducts
8. sewers
9. pipelines, and
10. silos.

Why do I need to be concerned about Confined Space Entry?

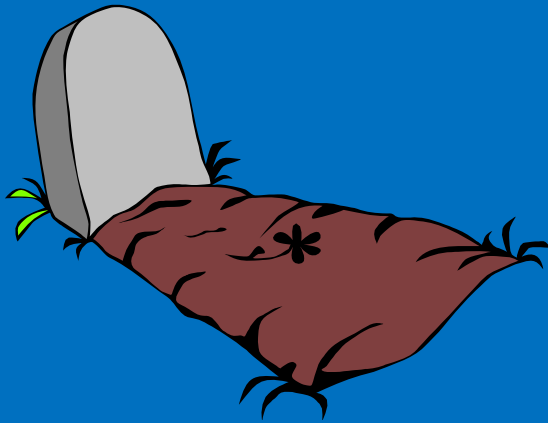
Employees face increased risk to serious physical injury from hazards such as

- A hazardous atmosphere
- A material that has the potential for engulfing an entrant
- An internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Any other recognized serious safety or health hazard



Why do I need to be concerned about Confined Space Entry?

- Deaths in confined spaces often occur because the atmosphere is oxygen deficient or toxic, confined spaces should be tested prior to entry and continually monitored.
- More than 60% of confined space fatalities occur among would-be rescuers.



Fatal Accidents

35%	Supervisor or Higher
60%	Rescuers
64%	Did not need to enter
66%	Water / Wastewater
78%	Oxygen deficient or IDLH
<u>95%</u>	<u>No training</u>
<u>100%</u>	<u>No powered ventilation</u>
<u>100%</u>	<u>No instrument at site to measure hazardous atmosphere.</u>

Reasons for Entering Confined Spaces.

- Inspection
- Repair
- Maintenance (cleaning or painting), or similar operations which would be an infrequent or irregular function of the total industrial activity.
- Emergency rescue.

Entry must be well planned before initial entry is made and the hazards must be thoroughly reviewed.



Case Study #1.

- A 20-year-old construction worker died while attempting to refuel a gasoline engine powered pump used to remove waste water from a 66 inch diameter sewer line that was under construction.
- The pump was approximately 3,000 feet from where the worker had entered the line.
- The worker was overcome by carbon monoxide.
- A co-worker, who had also entered the sewer line, escaped.
- A 28-year-old state inspector entered from another point along the sewer line and died in a rescue attempt.
- Both deaths were due to carbon monoxide intoxication.
- In addition to the fatalities, 30 firefighters and 8 construction workers were treated for carbon monoxide exposure.
- NIOSH ALERT: January 1986, DHHS (NIOSH) Publication No. 86-110

Case Study #2.

- A 22-year-old worker died inside a ***toluene storage tank*** that was 10 feet in diameter and 20 feet high while attempting to clean the tank.
- The worker entered the tank through the 16 inch diameter top opening using a 1/2 inch rope for descent.
- Although a self-contained breathing apparatus was present, the worker was not wearing it when he entered the tank.
- The worker was overcome and collapsed onto the floor the tank.
- In an attempt to rescue the worker, ***fire department personnel began cutting an opening into the side of the tank.***
- The tank exploded, killing a 32-year-old firefighter and injuring 15 others.
- NIOSH ALERT: January 1986, DHHS (NIOSH) Publication No. 86-110

Case Study #3.

- A crew foreman became ill and was hospitalized after using an epoxy coating, which contained 2-nitropropane and coal tar pitch, to coat a valve on an underground waterline.
- The valve was located in an *enclosed service vault (12' x 15' x 15')*.
- The worker was released from the hospital on July 3, but was readmitted on July 6; he lapsed into a coma and died on July 12, as a result of acute liver failure induced by inhalation of 2-nitropropane and coal tar pitch vapors.
- A co-worker was also hospitalized, but did not die.
- NIOSH ALERT : January 1986, DHHS (NIOSH) Publication No. 86-110

California OSHA Regulations.

California Code of Regulations

Title 8

“General Industry Safety Orders”

Section 5157

“Permit Required Confined
Spaces.”



<http://www.dir.ca.gov/Title8/5157.html>

<http://www.dir.ca.gov/Title8/5157c.html>

What are the Key Elements of Confined Space Entry?

1. Types of Confined Spaces.
2. Confined Space Hazards.
3. Hazard Controls.
4. Identification and Classification of Confined Spaces.
5. Entry Permits and Procedures.
6. Roles and Responsibilities.
7. Training.
8. Outside Emergency Rescue Services.



Types of Confined Spaces: Non-Permit Required.

Non-Permit Required:

- A Confined Space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.
- Still considered a confined space.



Types of Confined Spaces: Permit Required.

Permit Required Confined Space:

- Entry permit means the written or printed document that is provided by the employer to allow and control entry into a permit space.
- Hazards exist.
Avoid entry if possible.
 - A hazardous atmosphere
 - A material that has the potential for engulfing an entrant
 - An internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
 - Any other recognized serious safety or health hazard



Hazards.

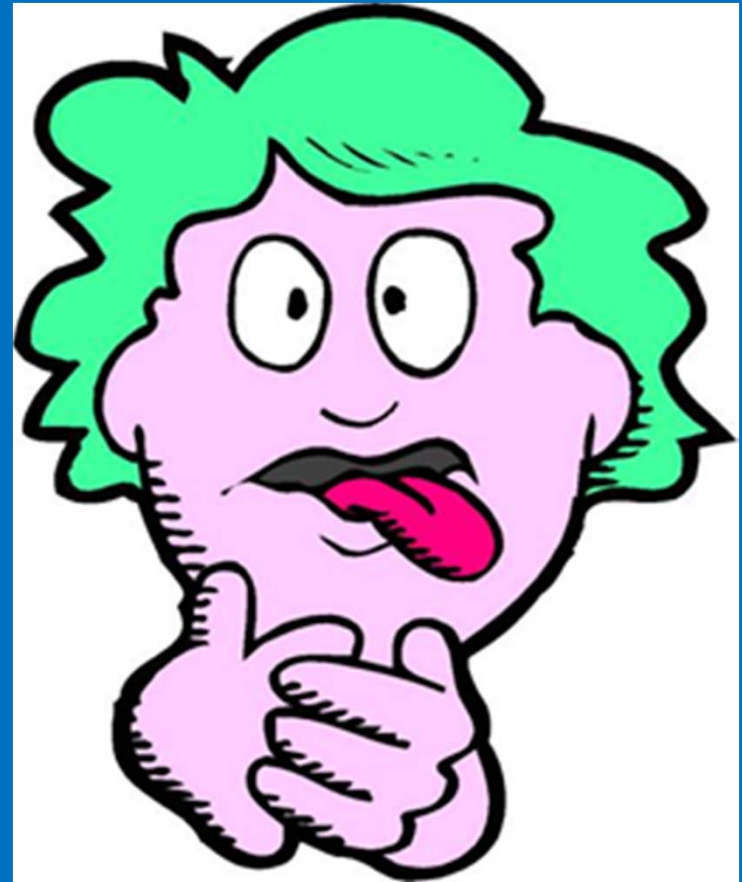
- Atmosphere
- Engulfment
- Entrapment
- Safety Hazards



Hazards: Atmospheres.

Hazardous atmospheres encountered in confined spaces can be divided into four distinct categories:

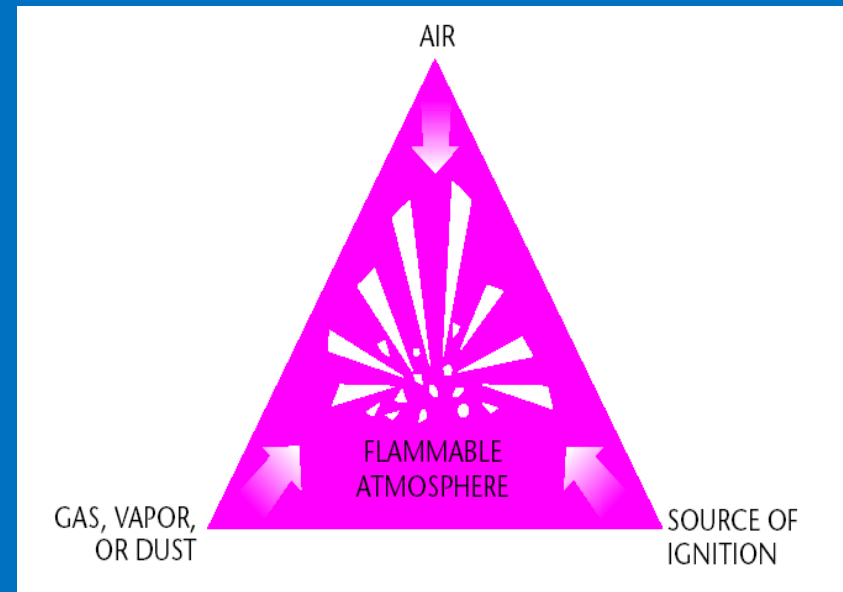
- Flammable,
- Toxic,
- Irritant and/or Corrosive, and
- Asphyxiating.



Atmospheres: Flammable.

A flammable atmosphere generally arises from ...

- enriched oxygen atmospheres,
- vaporization of flammable liquids,
- by-products of work,
- chemical reactions,
- concentrations of combustible dusts, and
- chemical from inner surfaces of the confined space.



Atmospheres: Toxic.

The sources of toxic atmospheres encountered may arise from the following:

- **The product stored**
(removing decomposed organic material from a tank can liberate toxic substances, such as hydrogen sulfide (H₂S)).
- **The operation performed in the confined space**
(welding or brazing with metals capable of producing toxic fumes).



Toxics: Carbon Monoxide.

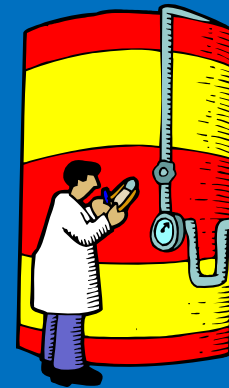
Incomplete combustion.

- Gasoline engines, acetylene welding, industrial heating (boilers).
- Colorless and odorless gas.
- Air purifying respirators are not effective.
- Early stages of CO intoxication are nausea and headache.
- Carbon monoxide may be fatal at 1000 ppm in air, and is considered dangerous at 200 ppm, because it forms carboxyhemoglobin in the blood which prevents the distribution of oxygen in the body.



Atmospheres: Irritant / Corrosive.

- The primary irritants exert no systemic toxic effects (effects on the entire body).
 - *Primary irritants are chlorine, ozone, hydrochloric acid, hydrofluoric acid, sulfuric acid, nitrogen dioxide, ammonia, and sulfur dioxide.*
- A secondary irritant is one that may produce systemic toxic effects in addition to surface irritation.
 - *Secondary irritants include benzene, carbon tetrachloride, ethyl chloride, trichloroethane, trichloroethylene, and chloropropene.*

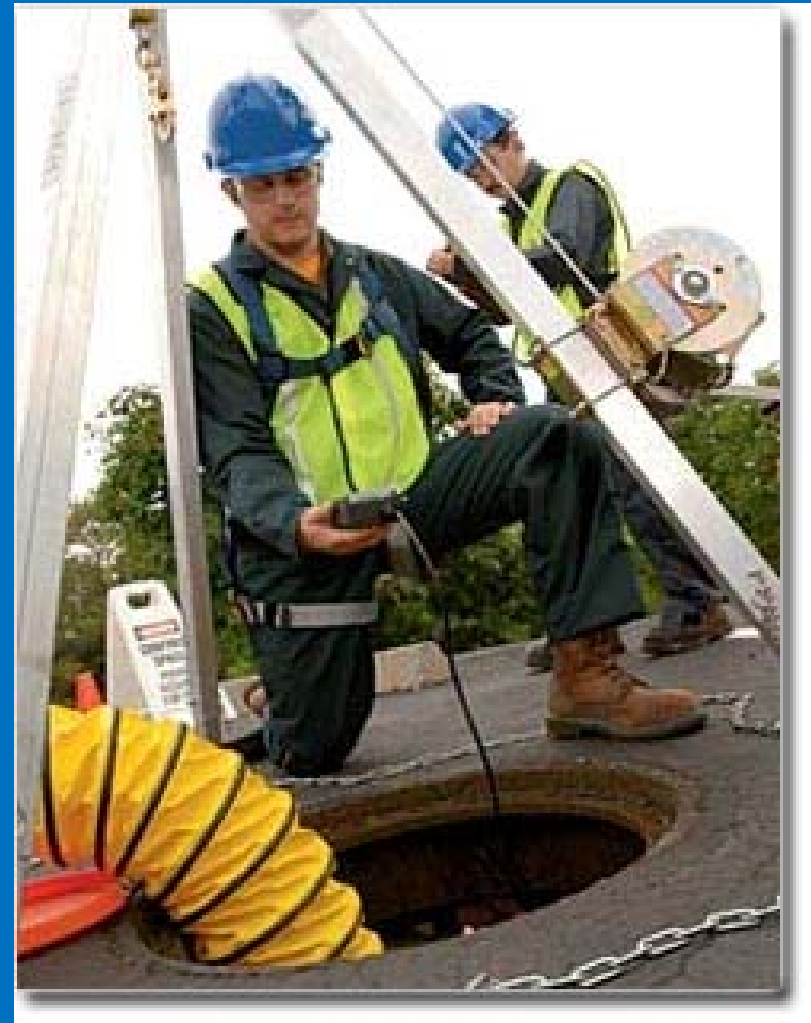


Atmospheres: Asphyxiating.

The normal atmosphere is composed approximately of

- 20.9% oxygen and
- 78.1% nitrogen, and
- 1% argon with small amounts of various other gases.

Reduction of oxygen in a confined space may be the result of either consumption or displacement.



Asphyxiating: Oxygen Consumption.

The consumption of oxygen takes place during combustion of flammable substances, as in welding, heating, cutting, and brazing.

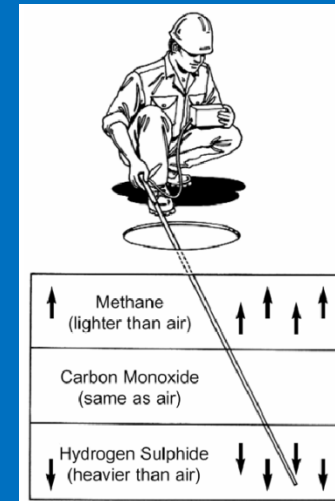
- **Bacterial action**, as in the fermentation process.
- **Chemical reactions** as in the formation of *rust on the exposed surface* (iron oxide).
- **Number of people working** and **physical activity** will influence the oxygen consumption rate.



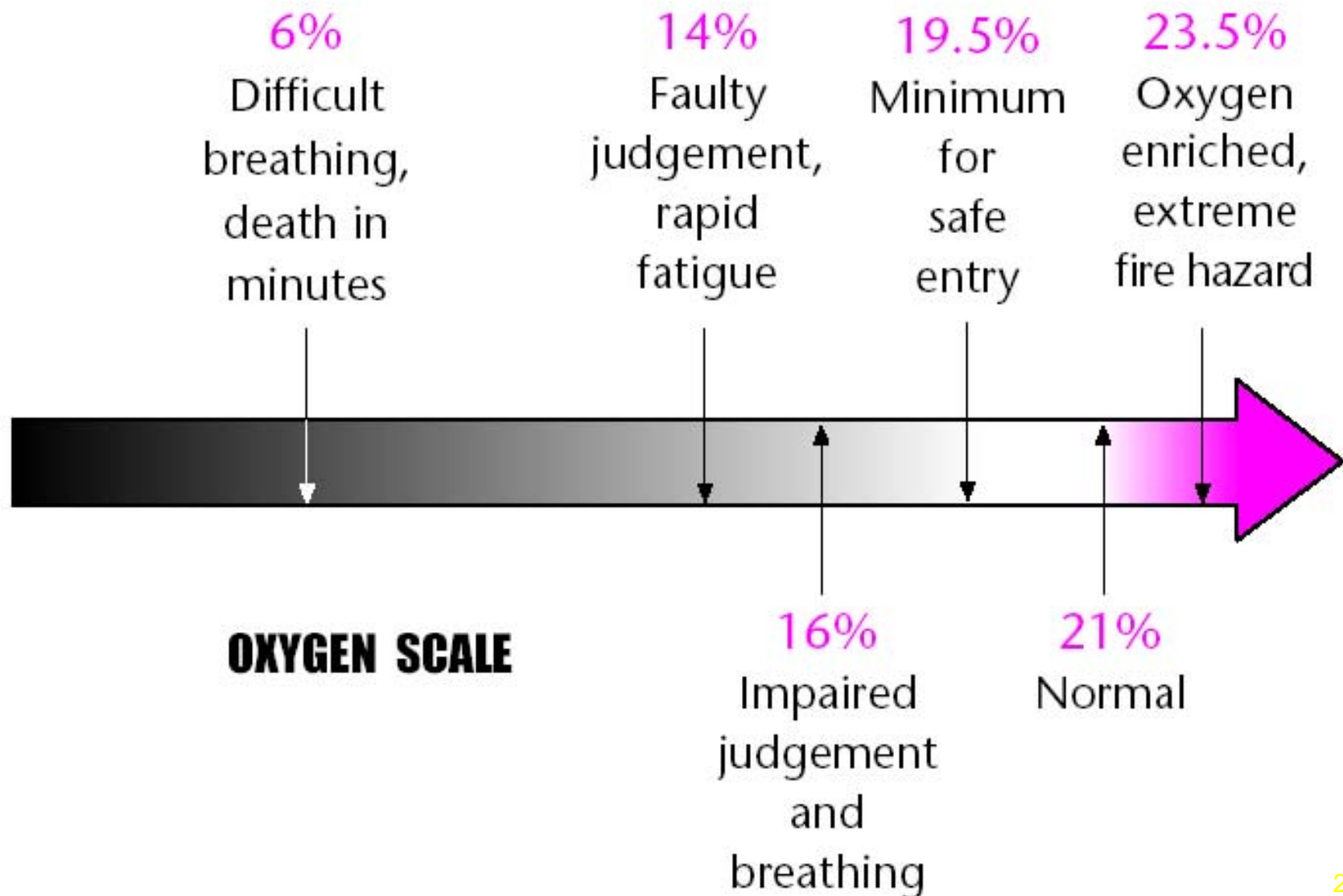
Asphyxiating: Oxygen Displacement.

Gases are used to displace air, and therefore reduce the oxygen level.

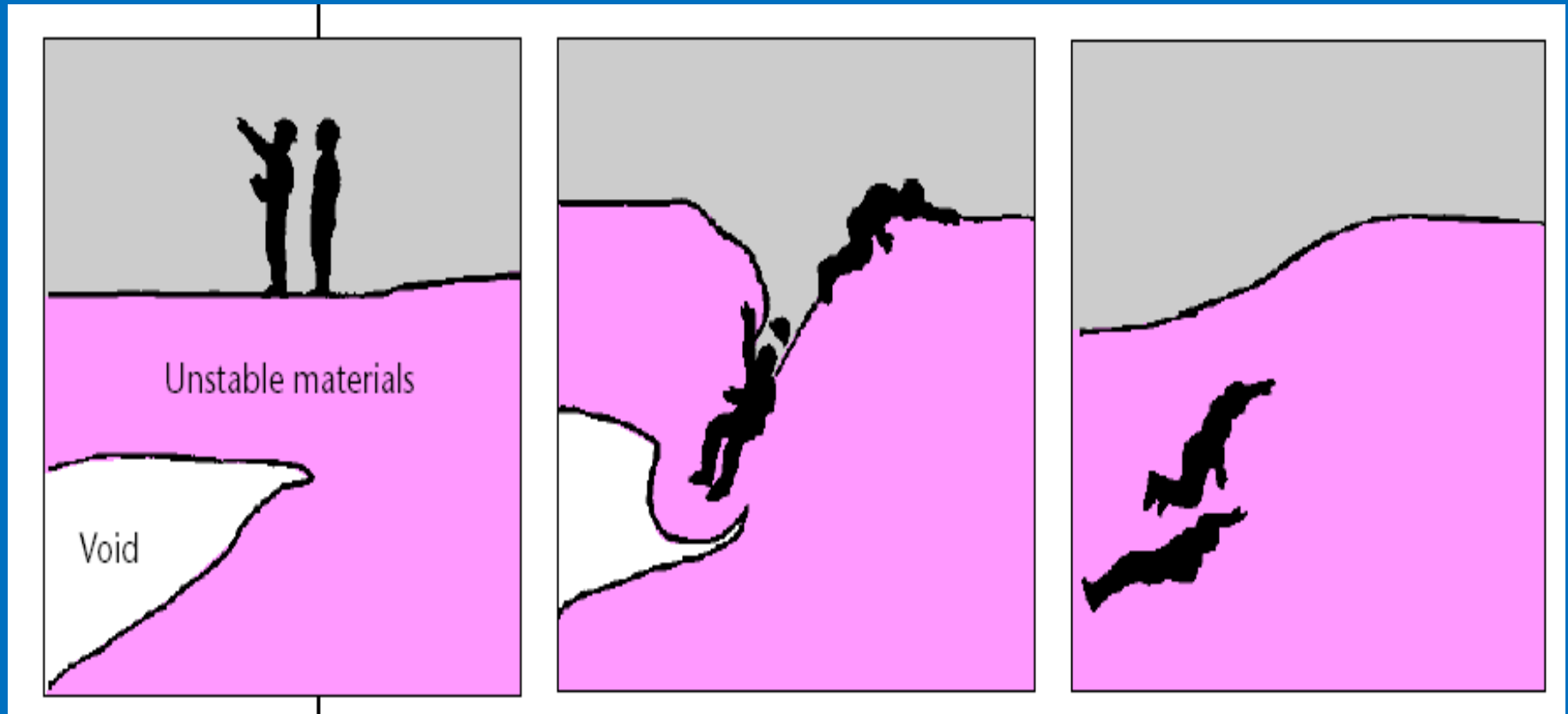
- Carbon dioxide can occur naturally.
- Gases such as nitrogen, argon, helium, and carbon dioxide, are referred to as non-toxic inert gases.
- Carbon dioxide and argon, with specific gravities greater than air, may lie in a tank or manhole.
- Gases are colorless and odorless, they pose an immediate hazard to health unless appropriate oxygen measurements and ventilation are adequately carried out.



Asphyxiating: Effects of Oxygen Deficiency



Hazards: Engulfment.



Hazards: Entrapment.

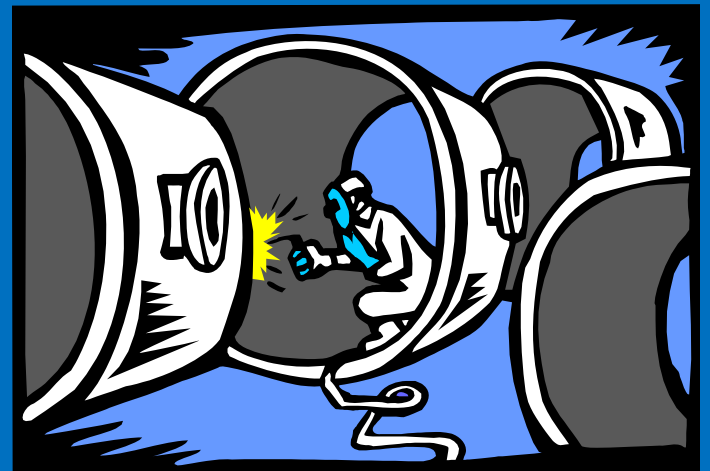
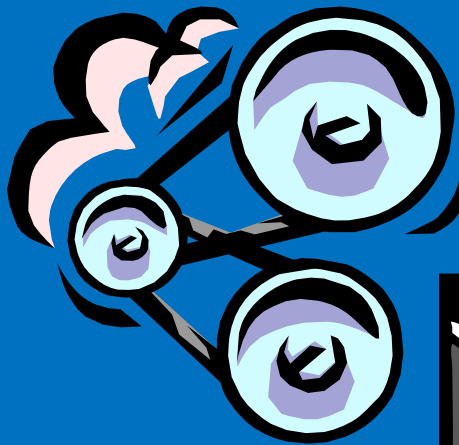
A confined space that has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.



Hazards: Other.

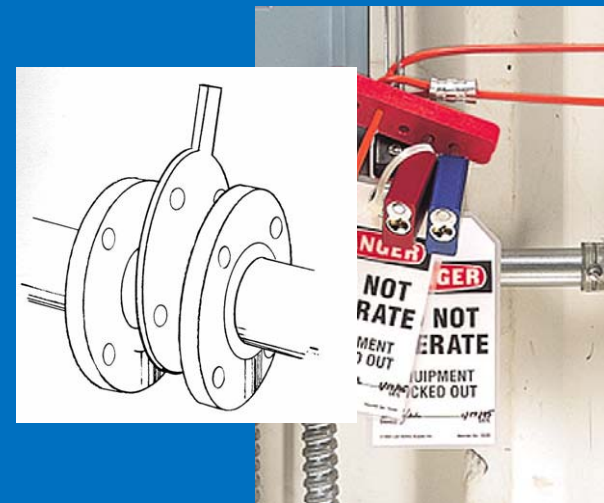
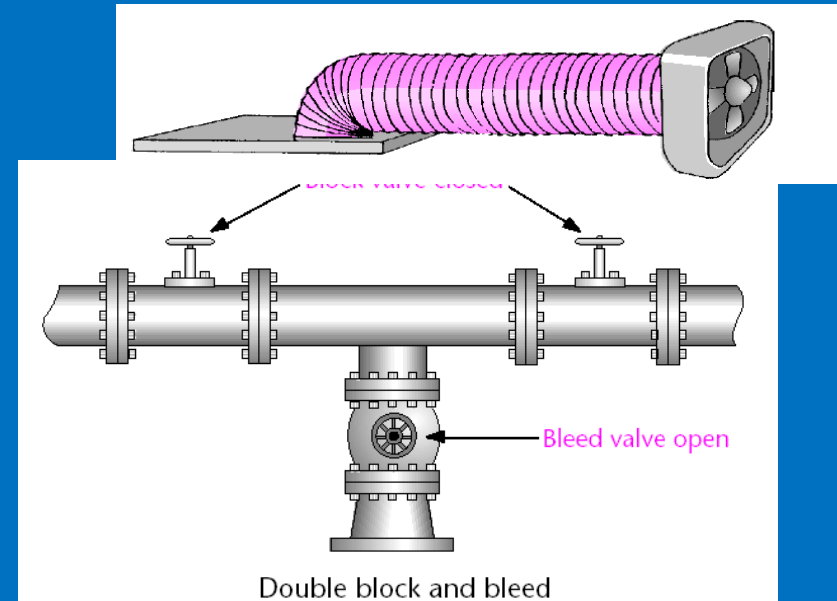
A confined space that contains any other recognized serious safety or health hazard.

- Machine guarding,
- Mixing blades,
- Slip and fall,
- Heat,
- Cold
- Electrical shock,
- Chemicals, paints, adhesives,
- Hot work, welding, cutting.



Hazard Controls.

- Check for atmospheric hazards and document levels.
 - Oxygen,
 - Flammable Lower Explosive Limit.
 - Carbon monoxide,
 - Other toxics.
- Forced air ventilation to control atmospheric hazards.
- Energy Control – Lockout Tagout Procedures.
- Flow lines disconnected, blinded and locked out.
- Chemical residues removed.



Hazard Controls: Atmospheric Monitoring.

Air Monitoring:

- *Test for oxygen first.*
- *Combustible gases second.*
- Toxic gases tested last.
- Test stratified atmospheres.



Hazard Controls: Forced Air Ventilation.

Ventilation Blowers

- ***100% outside air from clean source.***
- ***Purge from the bottom of the space.***
- Open space vents.
- 2000 cubic feet per minute for each welder per space.
- Test air periodically to ensure ventilation is controlling atmospheric hazards.



Hazard Controls: PPE and Respiratory Protection.

- Gloves, aprons, boots.
- Eye protection.
- Respiratory Protection
- Supplied air respirators.
- Self contained breathing apparatus.
- Fall protection equipment.



Hazard Controls: Lockout Tagout.

- *Machine guarding*
- *Mixing blades*
- *Heat*
- *Cold*
- *Electrical shock*
- *Piping and valves, chemicals, paints, adhesives.*



Hazard Controls: Physical Conditions.

Structural hazards within a confined space such as...

- baffles in horizontal tanks,
- trays in vertical towers,
- bends in tunnels,
- overhead structural members, or
- scaffolding installed for maintenance

...constitute physical hazards, which are exacerbated by the physical surroundings.

Surface residues in confined spaces can increase the already hazardous conditions.

Entry Permits and Procedures.

Each confined space is considered to be ...

Permit Required until it has been
evaluated and classified as a ...

- Permit Required or a ...
- Non-Permit Required Confined Space.

*Therefore, initial entry into any confined
space is assumed to be a
“Permit Required” space.*



Classification of “Permit Required Confined Space” to “Non- Permit Required”

A space classified by the employer as a permit-required confined space may be reclassified as a non-permit confined space under the following procedures:

- **If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space**, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.
- **If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated**, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

Certification of Entry Without Permit/Attendant

- 1. Confined spaces may be entered without the need for a written permit or attendant provided that the space can be maintained in a safe condition for entry by mechanical ventilation alone.***
2. All spaces shall be considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise.
3. Any employee required or permitted to pre-check or enter an enclosed/confined space shall have successfully completed training.
4. A written copy of operating and rescue procedures as required by these procedures shall be at the work site for the duration of the job.
5. The Confined Space Pre-Entry Check List must be completed by the LEAD WORKER before entry into a confined space. This list verifies completion of items listed below.
6. This check list shall be kept at the job site for duration of the job. If circumstances dictate an interruption in the work, the permit space must be re-evaluated and a new check list must be completed.

Checklist – Entry Without Permit/Attendant

1. Controls of atmospheric and engulfment hazards.

2. Pumps and Lines.

All pumps and lines which may reasonably cause contaminants to flow into the space shall be disconnected, blinded and locked out, or effectively isolated by other means to prevent development of dangerous air contamination or engulfment.

A. Not all laterals to sewers or storm drains require blocking. However, where experience or knowledge of industrial use indicates there is a reasonable potential for contamination of air or engulfment into a occupied sewer, then all affected laterals shall be blocked.

B. If blocking and/or isolation requires entry into the space the provisions for entry into a permit-required confined space must be implemented.

3. Surveillance.

The surrounding area shall be surveyed to avoid hazards such as drifting vapors from the tanks, piping, or sewers.

Checklist – Entry Without Permit/Attendant

4. Atmospheric Testing.
 - A. The atmosphere within the space will be tested to determine whether dangerous air contamination and/or oxygen deficiency exists. Detector tubes, alarm only type gas monitors and explosion meters are examples of equipment that may be used to test permit space atmospheres.
 - B. Testing shall be performed by the LEAD WORKER who has successfully completed the Gas detector training for the monitors he will use. The minimum parameters to be monitored are oxygen deficiency, LFL, and hydrogen sulfide concentration.
 - C. A written record of the pre-entry test results shall be made and kept at the work site for the duration of the job.
 - D. The supervisor will certify in writing, based upon the results of the pre-entry testing, that all hazards have been eliminated. Affected employees shall be able to review the testing results.
 - E. The most hazardous conditions shall govern when work is being performed in two adjoining, connecting spaces.

Checklist – Entry Without Permit/Attendant

5. Authorized Entry for a Non-permit Required Confined Space.
 - A. *If there are no atmospheric hazards present and if the pre-entry tests show there is no dangerous air contamination and/or oxygen deficiency within the space and there is no reason to believe that any is likely to develop, entry into and work within may proceed.*
 - B. *Continuous testing of the atmosphere in the immediate vicinity of the workers within the space shall be accomplished.*
 - C. The workers will immediately leave the permit space when any of the gas monitor alarm set points are reached as defined.
 - D. Workers will not return to the area until a SUPERVISOR who has completed the gas detector training has used a direct reading gas detector to evaluate the situation and has determined that it is safe to enter.
 - E. Employees will not work alone.

Checklist – Entry Without Permit/Attendant

6. Rescue.

Arrangements for rescue services are not required if hazards are eliminated or controlled.

7. Employees will not work alone.

<http://www.dir.ca.gov/Title8/5157c.html>

Determine if the space is a “Permit Required Confined Space”

1. Is it a “Confined Space”?
2. Are there hazards present?
3. Can they be eliminated or controlled?

If **YES**,
Eliminate or Control
Hazardous Conditions,
classify the space to
“Non-Permit Required”.

If **NO**,
Submit a
“Confined Space Entry
Permit” before starting work.

Confined Space Determination Form	
Confined Space Jobsite Description	
Permit Requestor >	Work Order Number: >
Permit Request Date >	Work Plan:
Job Site Location >	
Manhole ID / Description >	
Confined Space Determination	
1. Is this space a Confined Space in accordance with the criteria listed here? ___(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; <u>and</u> ___(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); <u>and</u> ___(3) Is not designed for continuous employee occupancy.	If NO>> <u>NOT A CONFINED SPACE</u> Enter and proceed with the regular work assignment. Supervisor Signature> _____
2. If YES ... Survey the surrounding area for known or potential hazards. Are hazards present? ___Atmospheric, ___engulfment, ___entrapment, ___internal convergent configurations, ___List any other safety hazards _____ <u>Atmospheric Test Results:</u> Oxygen % _____ H2S ppm _____ LEL % _____ CO ppm _____	If NO>> <u>NON-PERMIT REQUIRED CONFINED SPACE</u> Enter and proceed with the regular work assignment. Supervisor Signature> _____
3. If YES ... Can the hazards be eliminated? List how the hazards are eliminated: _____ _____ _____	If YES>> <u>NON-PERMIT REQUIRED CONFINED SPACE</u> Eliminate the hazards and Reclassify to a Non-Permit Required Confined Space. Enter and proceed with the regular work assignment. Supervisor Signature> _____
4. If NO ... Can the space be maintained in a condition safe to enter by continuous forced air ventilation only?	If YES>> <u>NON-PERMIT REQUIRED CONFINED SPACE</u> <u>VENTILATE SPACE</u> and Reclassify to Non-Permit Required Confined Space. Enter and proceed with the regular work assignment. Supervisor Signature> _____
5. If NO ... Submit a Permit Required Confined Space Entry Permit Form on the next page for approval to proceed....	<u>REQUEST ENTRY INTO A PERMIT REQUIRED CONFINED SPACE.</u> SUBMITTED BY: Supervisor Signature> _____

Determination of a Permit Required Confined Space.

Is this space a Confined Space in accordance with the listed criteria?>>

- ___(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; **and**
- ___(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); **and**
- ___(3) Is not designed for continuous employee occupancy.

If NO, space does not meet the criteria ...

>> NOT A CONFINED SPACE

Enter and proceed with the regular work assignment.

Determination of a Permit Required Confined Space.

If YES, are hazards present? >>>>

Survey the surrounding area for known or potential hazards. Are hazards present?

Atmospheric, engulfment,
 entrapment,
 internal convergent configurations,
 List any other safety hazards

Atmospheric Test Results:

Oxygen % _____ H₂S ppm _____
LEL % _____ CO ppm _____

If NO hazards are present ...
>>NON-PERMIT REQUIRED
CONFINED SPACE

*Enter and proceed with the regular
work assignment.*

Determination of a Permit Required Confined Space.

If YES, hazards are present ...

Can the hazards be eliminated? >>>

List how the hazards are
eliminated: _____

If YES, hazards can be eliminated ...

>>NON-PERMIT REQUIRED
CONFINED SPACE

*Eliminate the hazards and Reclassify
to a Non-Permit Required Confined
Space.*

*Enter and proceed with the regular
work assignment.*

Determination of a Permit Required Confined Space.

If NO ...

Can the space be maintained in a condition safe to enter by continuous forced air ventilation only?

***If YES>>NON-PERMIT REQUIRED
CONFINED SPACE***

***VENTILATE SPACE and Reclassify to
Non-Permit Required Confined
Space.***

***Enter and proceed with the regular
work assignment.***

Authorized Entry for a Non-permit Required Confined Space

- A. *If there are no atmospheric hazards present and if the pre-entry tests show there is no dangerous air contamination and/or oxygen deficiency within the space and there is no reason to believe that any is likely to develop, entry into and work within may proceed.*
- B. *Continuous testing of the atmosphere in the immediate vicinity of the workers within the space shall be accomplished.*
- C. The workers will immediately leave the permit space when any of the gas monitor alarm set points are reached as defined.
- D. Workers will not return to the area until a SUPERVISOR who has completed the gas detector training has used a direct reading gas detector to evaluate the situation and has determined that it is safe to enter.
- E. Employees will not work alone.
- F. The minimum Personal Protective Equipment (PPE) for entry includes eye, head, hand, and foot protection and a full body harness.

Permit Required Confined Space.

Can the space be maintained in a condition safe to enter by continuous forced air ventilation only?

If NO ...

*This is a
“Permit Required Confined Space”!!!*

Submit a “Permit Required Confined Space Entry Permit Form” on the next page for approval to proceed....

***Complete the
“PERMIT REQUIRED
CONFINED SPACE” form
for approval.***

Entry Permits and Procedures.

- The Entry Permit Form must be used by anyone planning to enter a Permit Required Confined Space.
 - The Permit contains the required information about the hazards as well as equipment, personnel, and entry procedures.

Follow these instructions in completing the Entry Permit...

1. Notify Environmental Health and Safety Department (EH&S) prior to entry.
2. Ensure that all of the entry requirements are performed e.g. air testing, removal of hazards.
3. Sign the permit when the entry is completed.
4. Return the signed permit and associated documentation to EH&S Department for record keeping.

Roles and Responsibilities.

Confined Space Entry requires strict adherence to the duties of the...

- Entry Supervisor
- Authorized Entrant
- Attendant



Roles: Entry Supervisor.

Pre-entry:

1. Understand the duties of the Attendant and the Authorized Entrant.
2. Know the hazards.
3. Verify that the attendant and entrant know the hazards.
4. Verify equipment.
5. Verify Lockout Tagout.
6. Verify Permits are obtained (Confined Space, Hot Work)
7. Verify atmospheric tests are performed.
8. Verify procedures for communication, rescue and safe entry.
9. Verify means to summon outside rescue.
10. Verify entrant is wearing harness, if necessary.



Roles: Entry Supervisor.

Entry:

- Verify accurate records are kept by the attendant.
- Remove unauthorized individuals during entry operations.
- Verify that Acceptable Entry Conditions are being maintained.
- Determine when the operations will be transferred to another Entry Supervisor if operations continue beyond the shift.
- Assist outside rescue service.

Post Entry:

1. Close the Permit.
2. Participate in the annual review of Entry Permits with EH&S.

Roles: Authorized Entrant.

Pre-Entry:

1. Understand Duties and responsibilities of the Attendant.
2. Understands the hazards, including the signs and symptoms of exposure.
3. Demonstrates how to properly select and use the equipment needed.
4. Wear a harness and lifeline to assist exit from the confined space.



Who is required to wear *a full body harness and retrieval lines?*



All authorized entrants and rescuers entering permit spaces are required to use

full body harnesses and retrieval lines, unless it is determined that the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue operation.

Roles: Authorized Entrant.

Entry:

1. Communicate with the Attendant, enabling the Attendant to monitor the Entrant's status.
2. Alert the Attendant whenever the Entrant
 - a. Recognizes warning signs and symptoms of exposure to hazards.
 - b. Detects prohibited conditions.
3. Exit the confined space as quickly as possible when:
 - a. Receives orders to evacuate.
 - b. Recognizes warning signs or symptoms of exposure.
 - c. Detects a prohibited condition
 - d. Evacuation alarm is activated.



Roles: Attendant.

- Pre-Entry:
- Understand roles of the Entrant.
- Know the hazards, including the signs and symptoms of exposure.
- Know how to communicate to the Entrant and be alert to the needs of the Entrant.
- Make sure that a harness and lifeline are attached to the Entrant and secured to a point outside of the space.



Roles: Attendant.

Entry:

1. Remain outside of the space until relieved of duty.
2. Maintain an accurate count and identification of Entrants.
3. Monitor inside and outside activities of the Entrant to determine the safety of the Entrant to remain in the space.
4. Order Entrants out of the space if
 - A prohibited condition is detected.
 - The Entrant has a behavioral effect due to a hazard.
 - Outside conditions occur that could endanger the Entrant.
 - The Attendant can no longer safely perform the duties.
5. Communicate with Entrants and Entry Supervisors about any unauthorized entrants.
6. Summon emergency personnel immediately when the Entrant is determined to need assistance in exiting.
7. Inform emergency personnel of the hazards they will encounter during the rescue.

Rescue.

- Self Rescue.
- Non-entry rescue.
- Entry rescue.



Rescue: Self

Self rescue is best.

- Entrant recognizes signs and symptoms of exposure and exits the space.



Rescue: Non-Entry.

Retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the risk of entry or not contribute to the rescue of the entrant.

- ***Each authorized entrant shall use a chest or full body harness.***
- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space.
- ***A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet (1.52 m) deep***



Rescue: Entry by Outside Rescue Service.

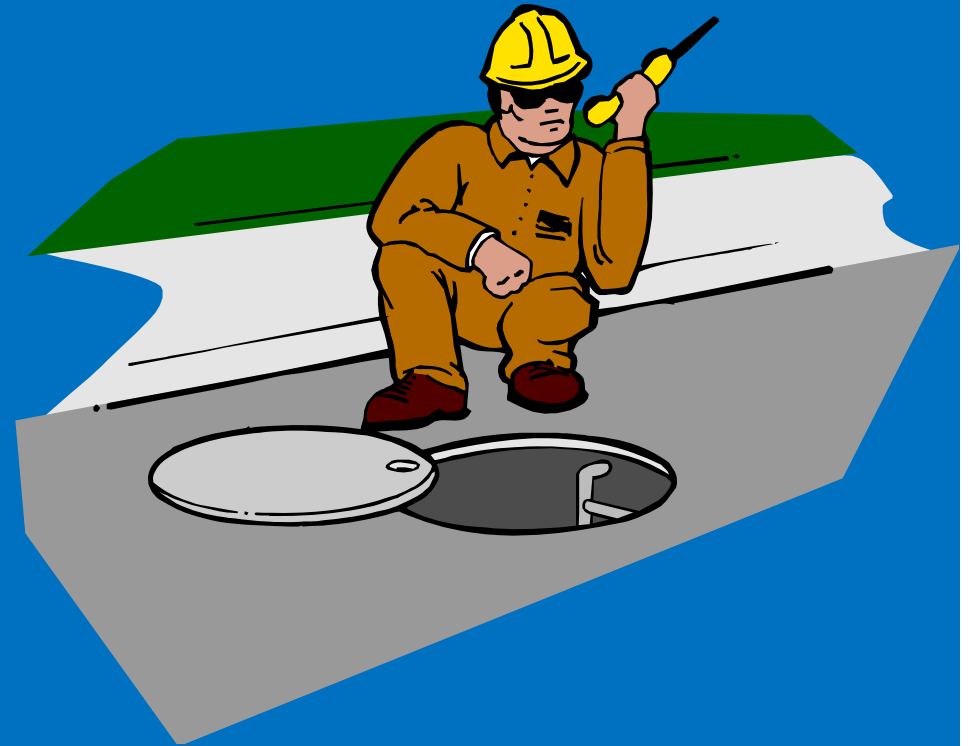
The Entry Supervisor will summons emergency services through the UPD Incident Commander.

- The Incident Commander will contact the City of San José Fire Department to respond and will escort them to the rescue scene.
- Information to be provided to the Fire Department.
 - Copies of the Confined Space Data Sheets.
 - Information about the operations and personnel involved in the incident.
 - Applicable MSDS, and
 - Any other information beneficial for the safe and effective rescue.



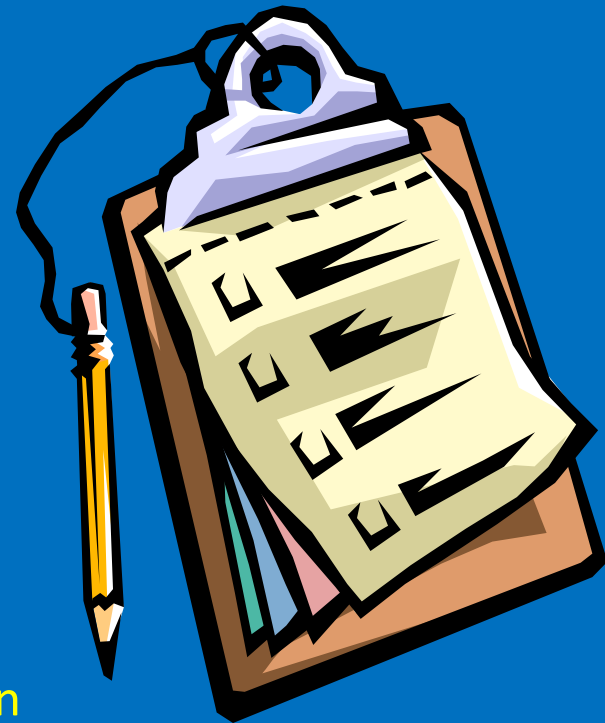
Confined Space Entry by Contractors.

- Inform contractor of the permit spaces where the work is to be performed.
- Apprise the contractor of the hazards present in the space.
- Apprise the contractor of precautions or procedures that have been implemented.
- Coordinate entry operations with the contractor.
- Debrief the contractor at the conclusion of the entry.



Summary.

- Know your confined spaces.
- Determine first if it is indeed a “Permit Required Confine Space”.
 - Don’t enter if you do not have to.
 - Attend mandatory training.
 - Cannot enter space unless trained and authorized.
- Inspect the space for unusual conditions.
- Monitor the air and ventilate as necessary.
 - Exit immediately if the monitor signals an alarm.
- Secure the space when entry is completed.
- Complete the confined space paperwork.



End

- Quiz is next ...

Confined Space Name: _____ Date: _____

Entry Quiz Employee ID# _____ Organization: _____

1. T – F A Confined Space is large enough and so configured that an employee can bodily enter and perform assigned work.
2. T – F A Confined Space has limited or restricted means for entry or exit.
3. T – F A Confined Space is not designed for continuous occupancy by the employee.
4. T – F More than 60% of confined space fatalities occur among would-be rescuers.
5. T – F A “Permit Required Confined Space” may contain a *hazardous atmosphere*
6. T – F A “Permit Required Confined Space” may contain a material that has the potential for *engulfing* an entrant.
7. T – F A “Permit Required Confined Space” may contain an internal configuration such that an entrant could be *trapped or asphyxiated* by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
8. T – F A “Permit Required Confined Space” may contain any other recognized *serious safety or health hazard*.

Confined Space Entry Quiz (continued)

9. T – F The normal atmosphere is composed approximately of 20.9% oxygen and 78.1% nitrogen, and 1% argon with small amounts of various other gases.
10. T – F Reduction of oxygen in a confined space may be the result of either *consumption or displacement*.
11. T – F Confined Space hazards are controlled by checking for atmospheric hazards, using forced air ventilation to control atmospheric hazards, using energy control – such as Lockout Tagout procedures, disconnecting flow lines and locking them out, removing chemical residues.
12. T – F Confined Spaces are best purged by forced air ventilation introduced at the bottom of the space.
13. T – F Each confined space is considered to be “Permit Required” until it has been evaluated and classified as a Permit Required or a Non-Permit Required Confined Space.
14. T – F “Self rescue” and “non-entry rescue” are the best types of rescue.
15. T – F Only trained and authorized employees are permitted to enter confined spaces.

The End

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