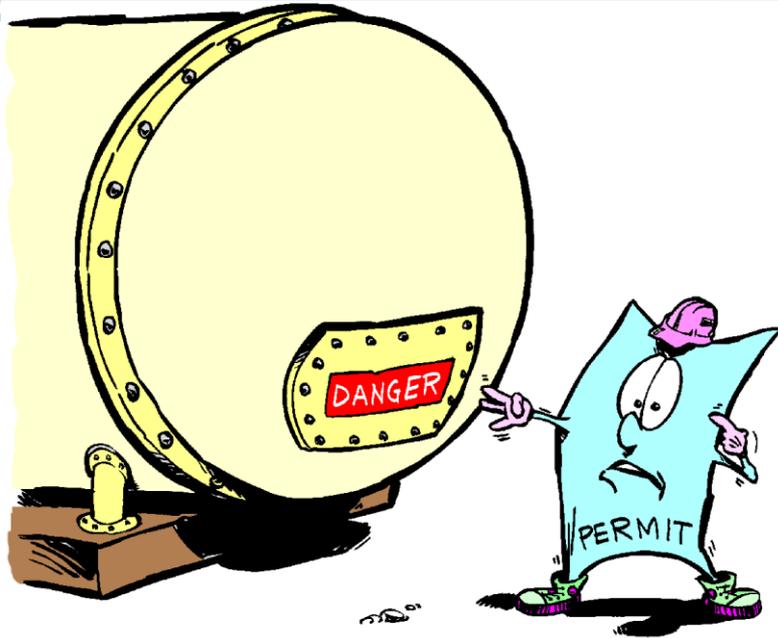


CONFINED SPACE SAFETY



CONFINED SPACE ENTRY NON-MARINE FACILITIES

**EM-385 Chapter 34 CONFINED SPACE ENTRY NON- MARINE
FACILITIES**

UFGS 013526

OSHA 29 CFR 1910.146

What is a Confined Space?



A space that:

- Is large enough and so configured that an employee can enter bodily and perform work;
- Has limited or restricted means of entry or exit;
- Is not designed for continuous worker occupancy.

Yep! Just
2 classes



Two Classifications for all confined spaces:

PERMIT REQUIRED CONFINED SPACE (PRCS)

NON-PERMIT REQUIRED CONFINED SPACE (NPRCS)

Examples of Confined Spaces:

- Tanks
- Manholes
- Boilers
- Furnaces
- Sewers
- Silos
- Hoppers



Tanks

- Vaults
- Pipes
- Trenches
- Tunnels
- Ducts
- Bins
- Pits



Underground Vaults



Sewers



Trenches



Tunnels



Hoppers

Potential Hazards in Confined Spaces



- **Oxygen Deficiency**

- <19.5% or >23.5% oxygen concentration

- **Combustibles**

- Methane
 - Hydrogen
 - Acetylene
 - Propane
 - Gasoline fumes



- **Toxic Materials**

- Carbon Monoxide
 - Hydrogen Sulfide
 - Welding fumes
 - Corrosives

- **Electricity**

- **Steam**

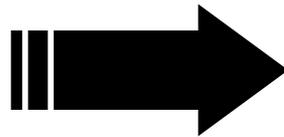
- **Mechanical Hazards**

- Mixers
 - Crushers

Permit-Required Confined Space



• A Permit-Required Confined Space is a confined space that has one or more of the following characteristics:



- Contains or has the potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an entrant;
- Has an internal configuration such that an entrant could become trapped or asphyxiated; or
- Contains any other serious safety or health hazard.

Non-Permit-Required Confined Space



Pages 1, 2 & 3
have lots of the
definitions about
confined spaces!



- Has been **Proven** to have no potential for any hazardous atmosphere.
- Has **No potential** to contain any hazards capable of causing death or serious physical harm.

Non-Permit-Required Confined Space



EXAMPLE

Trench greater than 4 feet deep, with no utility lines & atmosphere tested and LEL readings and O₂ level is acceptable & no gas powered equipment in the trench



CONFINED SPACE DEFINITIONS



Attendant: An individual stationed outside PRCs who monitors the entrants and performs attendants duties assigned in the employers permit space program.

Authorized Entrant: an employee who is authorized by the employer to enter a permit required space.

Entry Supervisor: person responsible for determining acceptable entry conditions are present, authorizes entry, and oversees entry operations, and terminates entry as required

Please keep everyone awake for this class!



IMMEDIATELY DANGEROUS TO LIFE OR HEALTH

IDLH



EM - 385 IDLH-respiratory hazard – *an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an Individual’s ability to escape from a dangerous atmosphere.*

EM – 385 IDLH- confined space- *any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effect or would Interfere with an individual’s ability to escape unaided from a permit space*

(OSHA 29 CFR 1910.146) IMMEDIATELY DANGEROUS TO LIFE OR HEALTH

- **Any condition that poses an immediate or delayed threat to life or would cause irreversible adverse health effects, or would interfere with an individual’s ability to escape unaided from a permit space.**

Responsible Person



- **The person directly responsible for the work being performed in the confined space. This can be the Team Leader, Foreman, journeyman, or other person qualified by training and experience.**

I'm the responsible person here partner!



ENTRY (Confined Space)



- **The act by which a person intentionally passes through an opening into a permit required confined space.**
- **Any part of the body passing through the opening is considered entry.**



Confined Space Team Members



Entrant Responsibilities

- To assure that the space has been adequately ventilated, isolated, emptied, or otherwise made safe for entry.
- To immediately exit a space, without question, upon word of the attendant, no matter what the reason.
- To follow all safety rules and procedures that apply to the job.
- To be familiar with the work to be performed and the procedures that apply to the job.
- To use the appropriate PPE whenever necessary.



Entrant Responsibilities



SUMMARY: MAJOR RESPONSIBILITIES

KNOW THE HAZARDS

PROPERLY USE THE EQUIPMENT

COMMUNICATE WITH ATTENDANT

**EVACUATE THE PRCS IF NECESSARY
OR WHEN DIRECTED**



Attendant Responsibilities



- **To monitor entrants during the job and during entry & exit to help insure their safety.**
 - **The attendant may not abandon his post for any reason while personnel are in the space unless relieved by another qualified attendant.**
- **To monitor atmospheric conditions in the space prior to and during entry.**
- **To control access to the confined space.**
- **To summon emergency assistance as needed.**
- **To assess hazards in and around the space, and take action on the same.**
- **To keep records of confined space work, such as air test results, personnel entry/exit, etc.**



Supervisor Responsibilities



- To assure adequate protection is provided to the entrants by verifying adequate lockout/tagout and that all hazards are securely isolated.
- To support the attendant's authority in controlling access to a confined space.
- To verify that all personnel have exited prior to closing the space.
- To assure that all personnel involved are aware of the hazards associated with the space.
- To assure that rescue services are .
- available prior to entry



NOTE: Supervisor authorizes the entrance to a PRCS

Contractor Responsibilities



- If an injured entrant is exposed to a substance that requires a MSDS or other written information kept at the worksite, the MSDS or written information shall be made available to medical facility treating the exposed entrant.



PRCS TRAINING REQUIREMENTS



To establish proficiency in all duties of all employees

Before employees are assigned the work

Before change in assigned duties

If a change in procedures or new hazard discovered

Employee demonstrates lack of knowledge



**06.I.07
has the
full list**

**ALL TRAINING DOCUMENTED
WITH, NAMES & DATES**



SPECIFIC TRAINING REQUIREMENTS



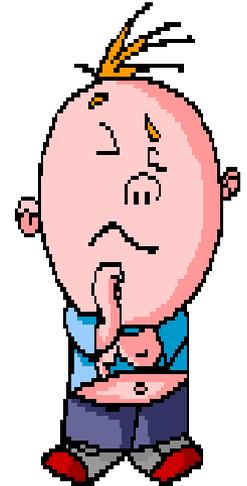
ENTRANTS :

Methods to communicate with the attendants

Means attendant use to notify entrants.

Operations of equipment including monitoring and rescue equipment and:

Evacuation signals procedures if need to notify the attendant to evacuate if detection of any dangerous condition.



SPECIFIC TRAINING REQUIREMENTS



ATTENDANTS:

Procedures to monitor (inside and outside) the PRCS to recognize hazards that effect entrants

Procedures for communicating with entrants

Procedures for evacuating entrants

Know conditions when evacuation is required

Procedures to control access to space and to warn unauthorized people away from the space

Their responsibility to remain outside the PRCS during duty, unless they are relieved by another attendant and

Non – entry rescue procedures



SPECIFIC TRAINING REQUIREMENTS



SUPERVISORS:

- Verifying permit completed properly**
- Verifying tests specified by the permit have been conducted**
- Verifying that procedures & equipment specified by the permit are in place before allowing entry to begin**
- Procedures for determining if conditions are acceptable for entry**
- Authorizing entry**
- Supervising entry operations; and**
- Terminating entry**



ENTRY PROCEDURES

- **Permit-required confined space entry**

- **For hazardous or potentially hazardous confined space work**

- **Non-permit confined space entry**

- **For non-hazardous confined space work**

Permit-Required Confined Space



- Isolate the space
- Ventilate the space
- Conduct Tailboard
- Complete permit
- Test the atmosphere
- Enter the space

NOTE: All vertical PRCs to have a mechanical retrieval device when 5 foot or deeper

Permit-Required Confined Space



Isolate the space from all hazards

- **Close Valves**
 - Double block & bleed, or
 - Blank flange
- **Empty the Space**
 - Depressurize, vent & drain
- **Lockout/Tagout Equipment**
 - Electrical sources
 - Rotating/reciprocating parts
 - Hazardous materials
- **Clean residue from the space**

These things will eliminate any potential hazards in the space



Ventilate the Space



- **Use mechanical ventilation**
 - Fans Air horns
- **Ventilate at the rate of at least four (4) volumes per hour**
 - Larger spaces require more ventilation
- **Make sure air supply is not contaminated**
 - Ventilation air supply must be from fresh air uncontaminated with flammables, toxins, etc.



IMPORTANT TO KNOW

Ventilation 100% of time per 013526



Conduct a Pre – Entry Briefing



- **Entire crew must attend**
 - Attendants, entrants, entry supervisor
- **Review hazards of entry and work**
- **Review PPE**
- **Review procedure for contacting rescue**
 - verify rescue available
- **Complete permit**



See a copy
of a sample
permit on
page #4



EMERGENCY RESCUE



On-Site Rescue Team

Same level training as entrants



Two members trained
First aid and CPR

Use of all PPE and equipment

Practice rescues minimum of
once every 12 months.

Off-Site Rescue

Informed of all
hazards in space

Knowledge of when
entrants are in and
have left the space



Complete Entry Permit Form

- Permit must be correctly and completely filled out prior to entry.
- Permit must be activated by Entry Supervisor's signature to be valid.
- No entry is allowed without a valid permit.
- When work is completed, permit and pre-entry form should be returned to safety.
- Cancelled permits must be kept on file for at least one year.

This is the same as on page #



Test the Atmosphere



In this order:

Check for Oxygen Content:

**–At least 19.5% and
less than 23.5%**

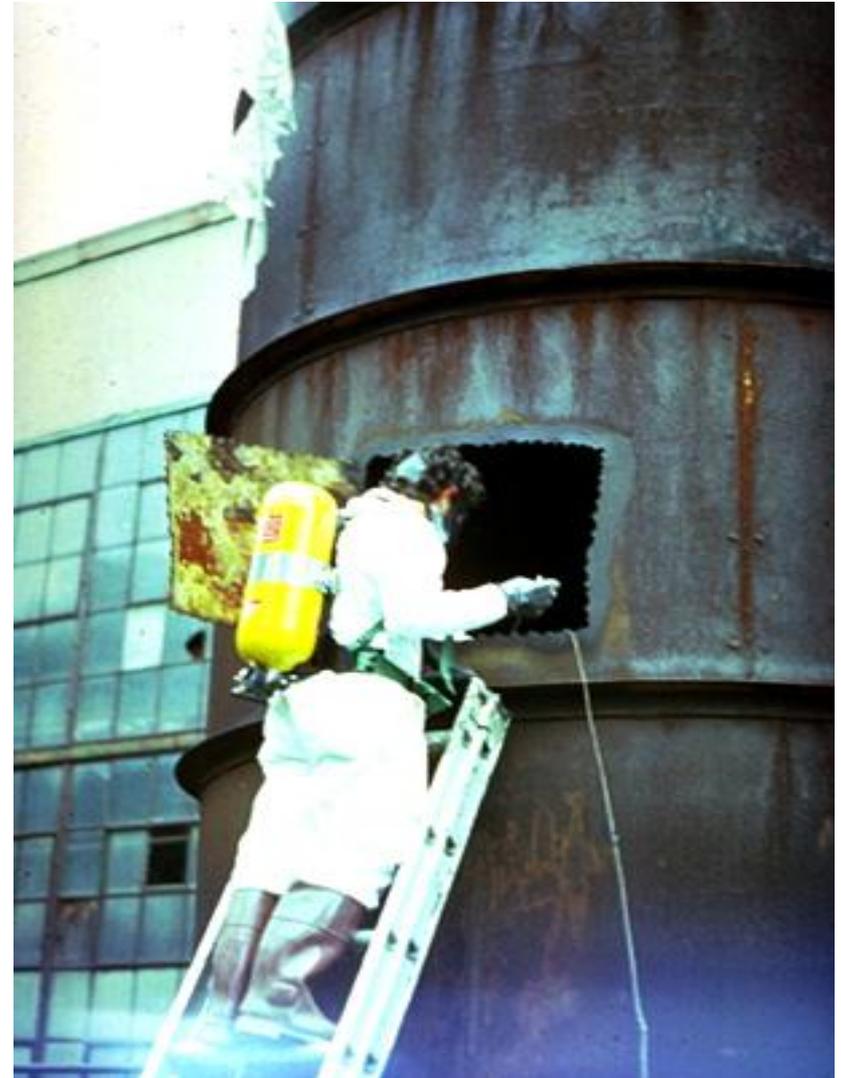
•Check for Combustibles:

–Less than 10% of the LEL

•Check for Toxic Gasses:

**–Most common is
carbon monoxide
(PEL <35 ppm)**

**–or any other hazardous
materials**



IMPORTANT NOTICE



- **Any time a limit is exceeded, no matter what the reason, all personnel shall immediately exit the space, and no others shall enter until atmospheric conditions are returned to safe levels.**

**There are NO
EXCEPTIONS
to this rule!**



Atmosphere Testing To Be Performed:



- **Prior to every entry when the space is vacant;**
- **At least hourly for permit-required confined spaces.**
- **More frequently, if conditions or suspicions warrant.**

**In Sewers, Wet Wells
CONTINUOUS
Monitoring is required!**

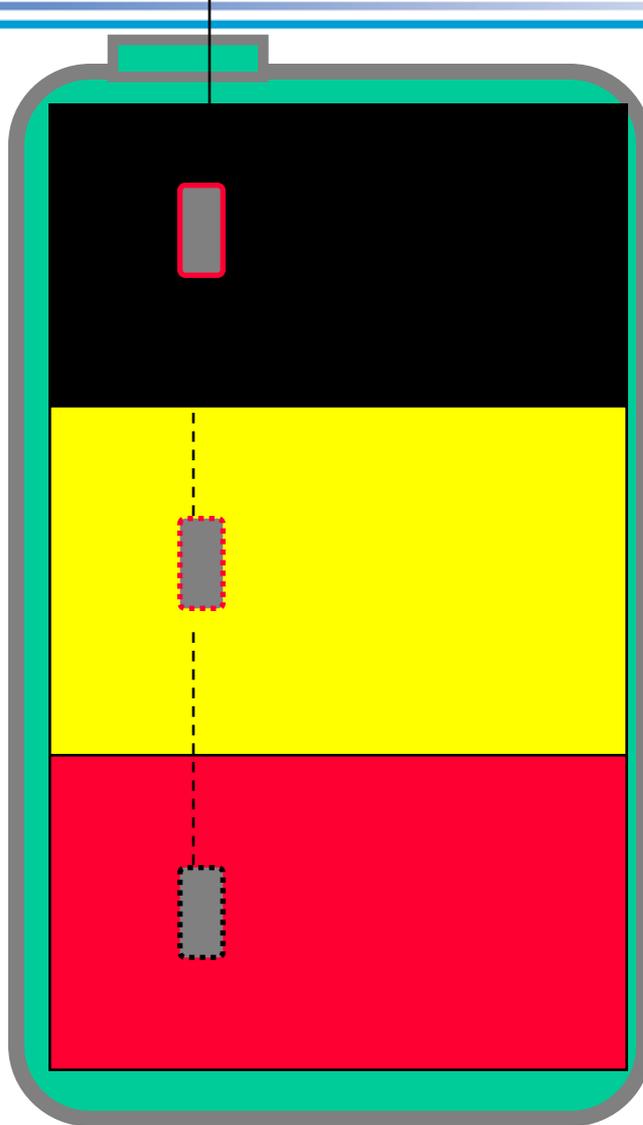


TESTING PROCEDURES



Always test the air at various levels to be sure that the entire space is safe.

Good air near the opening does NOT mean there is good air at the bottom!



Good Air

Poor Air

Deadly Air

Enter the Space and Proceed with work:



- An attendant shall be posted at the entrance for the duration of the work. He/she shall be in constant communication with the entrants while the job is in progress.



- All entrants shall sign log when entering the space & sign out when exiting.
- The attendant shall maintain permit & log for the duration of the work.

When the Job is Done:



**Remove all personnel,
tools, & debris**

Sign off the log.

Close the space.

Cancel the permit.

**Review the job with
host employer
(hazards, problems,
etc.)**



Non-Permit Confined Space Entry



- **Isolate the space**
- **Ventilate the space**
- **Evaluate the space**
 - **Test atmosphere**
 - **Assure justification conditions are met**
- **Conduct tailboard**
- **Enter the space**

Hey, this is the same stuff as the PRCs. So what is the difference huh???



Evaluation of the Space



Insure space meets conditions for non-permit justifications

Conduct atmospheric testing

Evaluation to be **certified**

****supervisor's signature****

Insure space has no potentially hazardous atmosphere

Continuous mechanical ventilation not acceptable as good atmosphere

No potential for engulfment

Internal configuration cannot trap or asphyxiate, or any other serious safety or health hazard

Yes the evaluation is critical!



Enter the Space and Proceed with work:



- **If non-permit conditions change during the job, the space shall be immediately evacuated, and re-classified as a permit-required confined space; or conditions shall be returned to non-permit conditions and again certified as such by the entry supervisor.**

Look here these are procedures covered in the contractor Confined Space Program



Contractor Confined Space Program



- **Contractors must be informed of the hazards within the space**
- **Contractors must follow their own established confined space entry procedure and use their own permit forms**
- **Contractors must supply their own attendants**
- **Contractors must supply their own air monitors**
- **Contractors must review entry after completion of job**



Gvt. folks use your own stuff too!!!

CONFINED SPACE REVIEW



Which answer
is correct???



A confined space is a space that:

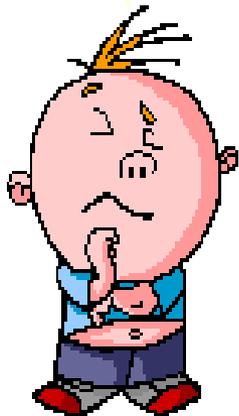
- a. Is large enough that a person can enter and perform work**
- b. Has limited or restricted means of entry or exit so the entrant is hindered from getting out in an emergency**
- c. Is not designed for continuous occupancy**
- d. All of the above**

CONFINED SPACE REVIEW



What is this answer?

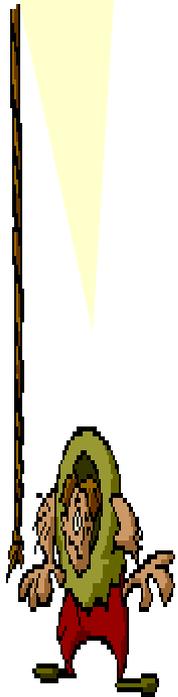
What are the two classifications for confined spaces?



CONFINED SPACE REVIEW



Can you pull the answer out for this question?



Each member of the rescue/ emergency team shall be provided with, and trained in the proper use of _____ & _____ necessary for making rescues from PRCs.

- a. Tools & Training
- b. PPE & Equipment
- c. First Aid & tools uses
- d. Equipment & training

CONFINED SPACE REVIEW



Major responsibilities of entrants to a Permit Required Confined Space (PRCS) are to:

- a. Know the hazards; properly use equipment
- b. communicate with attendant: evacuate from the PRCS
- c. Evacuate the PRCS; alert the attendant
- d. All the above

Which of these answers is the correct one??



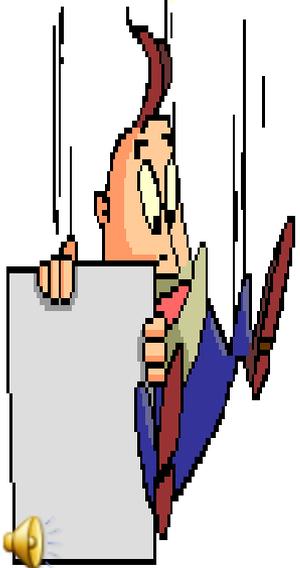
CONFINED SPACE REVIEW



I'm falling
with the
correct
answer here!

How often is it required for each member of the on-site rescue/emergency team to practice making a PRCS rescue? At least once every _____.

- a. 12 months**
- b. 6 months**
- c. once every month**
- d. once every week**



CONFINED SPACE REVIEW



Don't fall for
the wrong
answer here!

**What person, on a PRCS
"team" actually authorizes
the entry into the confined space?**

- a. Person doing the monitoring**
- b. Person who will enter the space**
- c. Supervisor**
- d. Any of above, once the permit is issued**



CONFINED SPACE REVIEW



A mechanical device shall be ready to retrieve folks from a vertical PRCs that is more than _____ how many feet deep?

- a. 4 feet (1.3 meters)**
- b. 5 feet (1.5 meters)**
- c. 6 feet (1.8 meters)**
- d. None of the above**



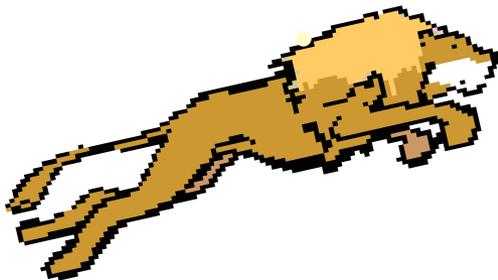
CONFINED SPACE REVIEW



I can catch the answer to this one!!

A contractor who is going to do how work in a confined space is required to have what type of ventilation?

- a. Mechanical ventilation**
- b. Electrical ventilation**
- c. Continuous ventilation**
- d. Occasional ventilation**



CONFINED SPACE REVIEW



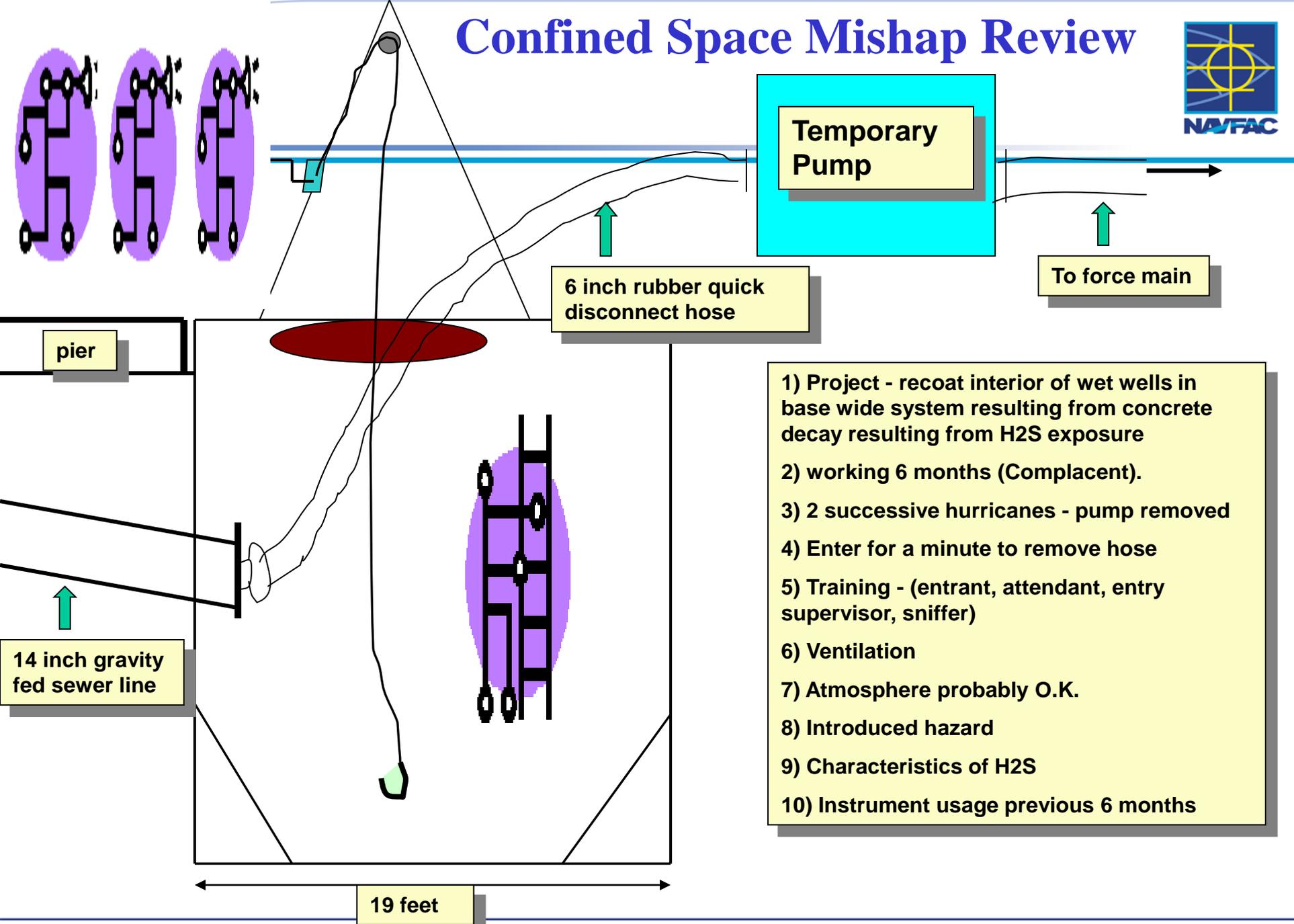
Remember your A, B, C's
ALWAYS BE CAREFUL
on this question!



A contractor is going to do work in a sewer or wet well. What are the air monitoring requirements for this location.

- a. Before entrants go in.
- b. At the start and end of each shift
- c. Bottom where work taking place
- d. Continuously monitor the space

Confined Space Mishap Review



- 1) Project - recoat interior of wet wells in base wide system resulting from concrete decay resulting from H2S exposure
- 2) working 6 months (Complacent).
- 3) 2 successive hurricanes - pump removed
- 4) Enter for a minute to remove hose
- 5) Training - (entrant, attendant, entry supervisor, sniffer)
- 6) Ventilation
- 7) Atmosphere probably O.K.
- 8) Introduced hazard
- 9) Characteristics of H2S
- 10) Instrument usage previous 6 months