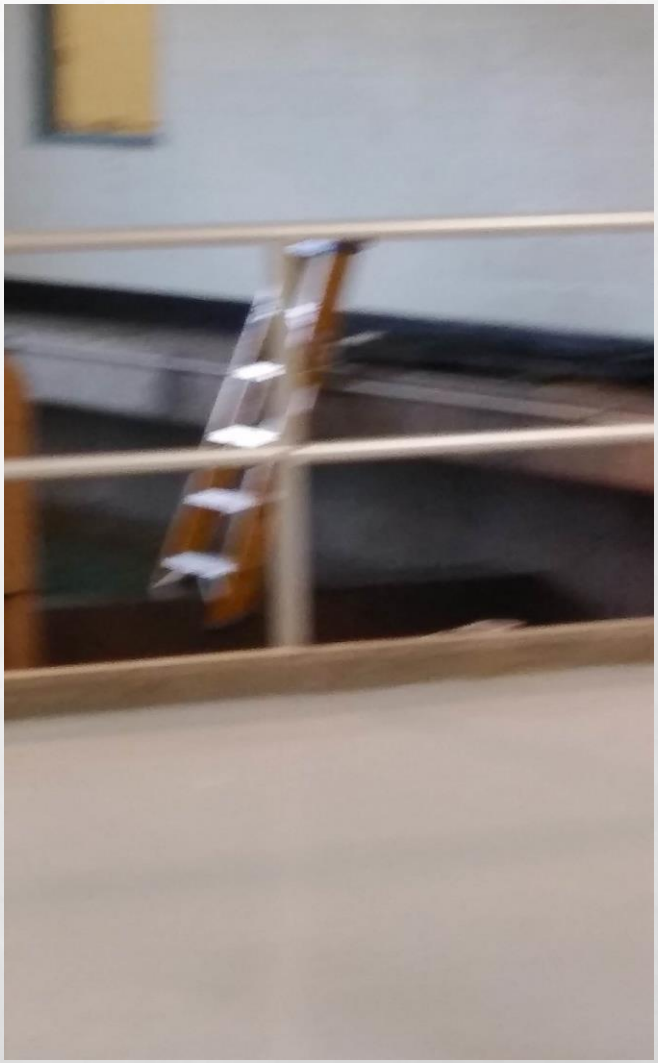
WELCOME

OPERATORS TRAINING COMMITTEE OF OHIO

- INTRODUCTIONS
- HOUSE KEEPING
- SAFETY

WHY ARE WE HERE



CONFINED SPACES AWARENESS

OBJECTIVES FOR MODULE #1

AFTER THIS MODULE YOU SHOULD BE ABLE TO :

- IDENTIFY THE STANDARDS ASSOCIATED WITH CONFINED SPACES.
- IDENTIFY WHAT CONSTITUTES A CONFINED SPACE.
- IDENTIFY TYPES OF CONFINED SPACES.
- UNDERSTAND TERMS ASSOCIATED CHARACTERISTICS OF CONFINED SPACES

STANDARD

- PERMIT-REQUIRED CONFINED SPACES
  - NFPA 1670
  - 29 CFR 1910.146

29 CFR 1910.146
PERMIT-REQUIRED CONFINED SPACES

- SCOPE & APPLICATION
- DEFINITIONS
- GENERAL REQUIREMENTS (TO INCLUDE DEV. OF WRITTEN PLAN)
- PERMIT-REQUIRED CONFINED SPACES
- PERMIT SYSTEM
- ENTRY PERMIT
- TRAINING
- DUTIES OF AUTHORIZED ENTRANTS
- DUTIES OF ATTENDANTS
- DUTIES OF ENTRY SUPERVISORS
- RESCUE & EMERGENCY SERVICES
- EMPLOYEE PARTICIPATION

APPENDICES

- APPENDIX A - PERMIT-REQUIRED CONFINED SPACE DECISION FLOW CHART
- APPENDIX B - PROCEDURES FOR ATMOSPHERIC TESTING
- APPENDIX C - EXAMPLES OF PERMIT-REQUIRED CONFINED SPACE PROGRAMS
- APPENDIX D - CONFINED SPACE PRE-ENTRY CHECK LIST
- APPENDIX E - SEWER SYSTEM ENTRY
- APPENDIX F - RESCUE TEAM OR RESCUE SERVICE EVALUATION CRITERIA

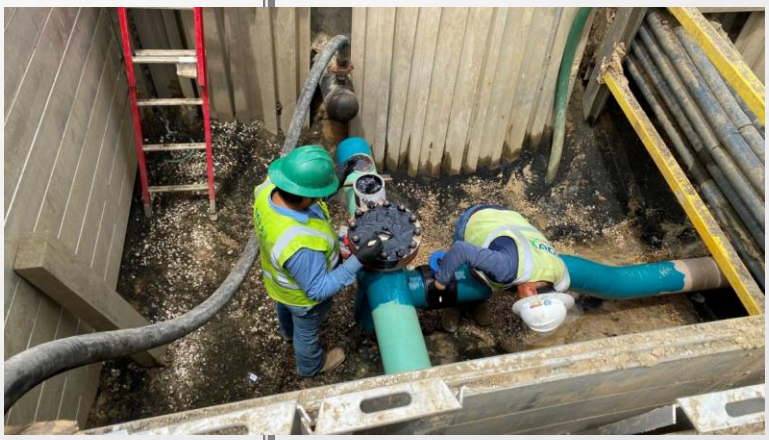
CONFINED SPACE ?

IS LARGE ENOUGH & SO CONFIGURED THAT EMPLOYEE CAN BODILY ENTER & PERFORM ASSIGNED WORK

CONFINED SPACE ?

HAS LIMITED OR RESTRICTED MEANS FOR ENTRY OR EXIT (I.E. TANKS, VESSELS, SILOS, PITS, VAULTS OR HOPPERS)

CONFINED SPACE ?



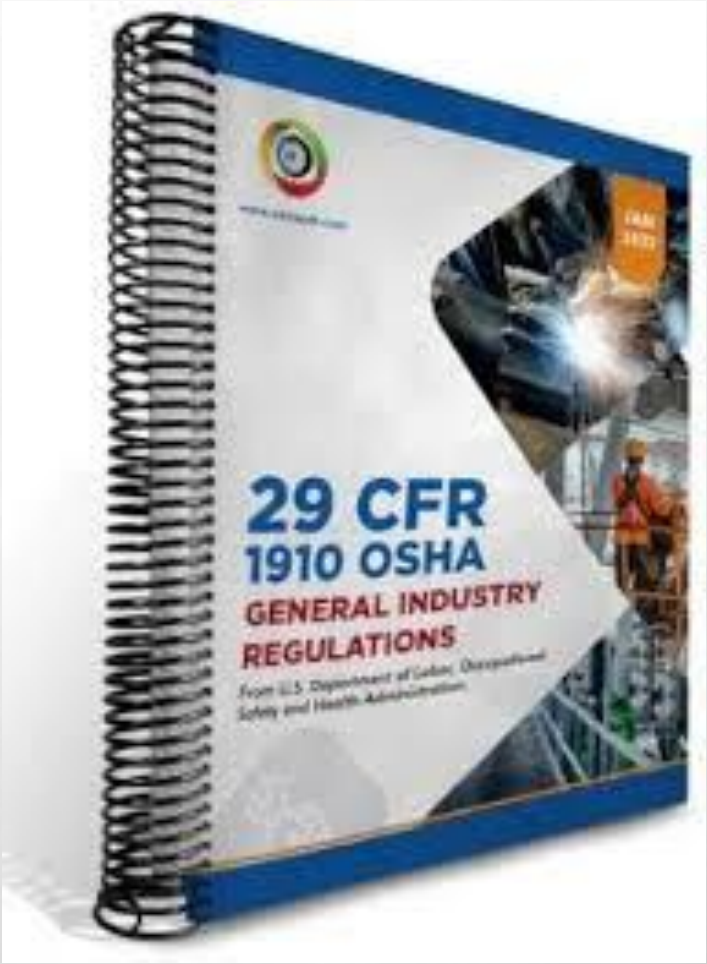
IS NOT DESIGNED FOR CONTINUOUS EMPLOYEE OCCUPANCY

CONFINED SPACE ?

IS LARGE ENOUGH & SO CONFIGURED THAT EMPLOYEE CAN BODILY ENTER & PERFORM ASSIGNED WORK

HAS LIMITED OR RESTRICTED MEANS FOR ENTRY OR EXIT (I.E. TANKS, VESSELS, SILOS, PITS, VAULTS OR HOPPERS)

IS NOT DESIGNED FOR CONTINUOUS EMPLOYEE OCCUPANCY



PERMIT-REQUIRED CONFINED SPACE

CONTAINS OR HAS POTENTIAL TO CONTAIN HAZARDOUS ATMOSPHERE

PERMIT-REQUIRED CONFINED SPACE

CONTAINS MATERIAL THAT HAS POTENTIAL FOR ENGULFING ENTRANT

PERMIT-REQUIRED CONFINED SPACE

HAS INTERNAL CONFIGURATION SUCH THAT ENTRANT COULD BE TRAPPED OR ASPHYXIATED BY INWARDLY CONVERGING WALLS OR BY FLOOR WHICH SLOPES DOWNWARD & TAPERS TO SMALLER CROSS-SECTION

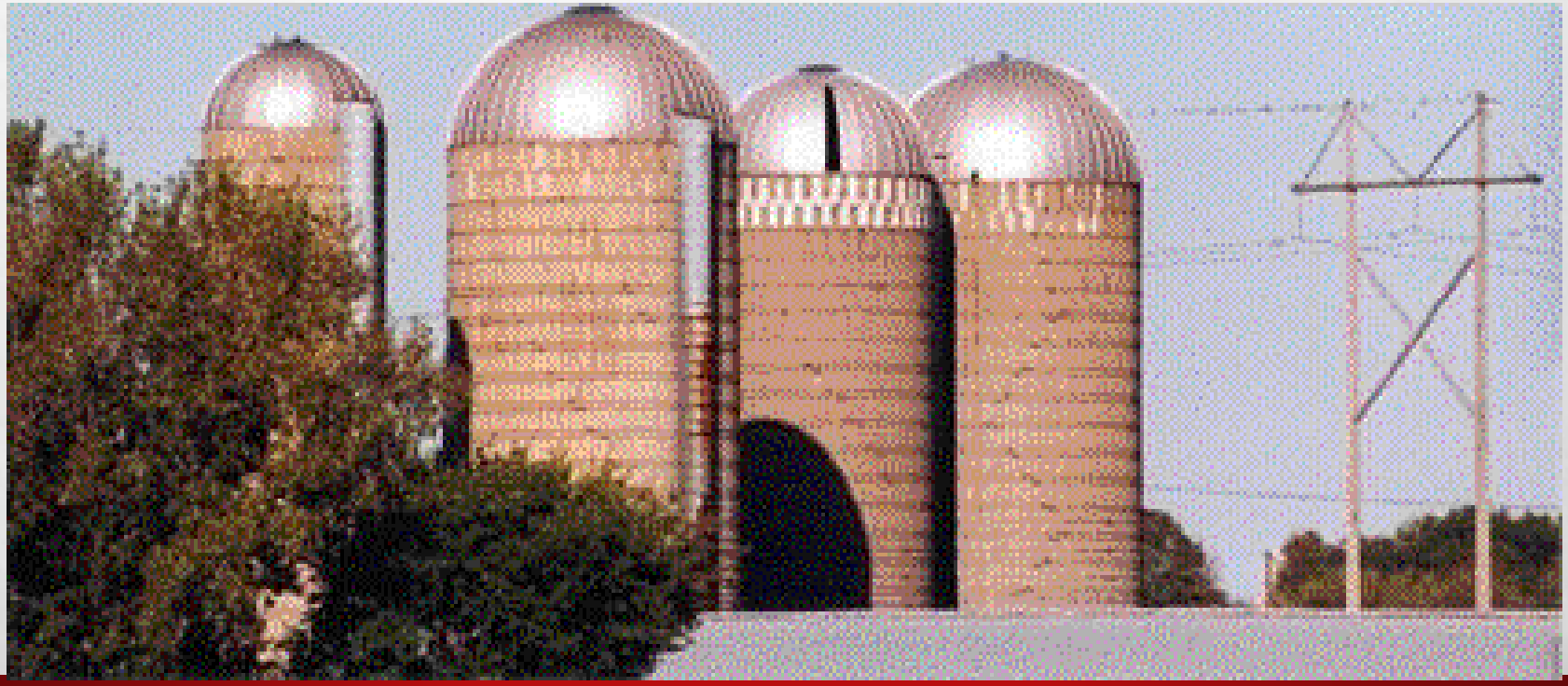
PERMIT-REQUIRED CONFINED SPACE

CONTAINS ANY OTHER SERIOUS SAFETY OR HEALTH HAZARD

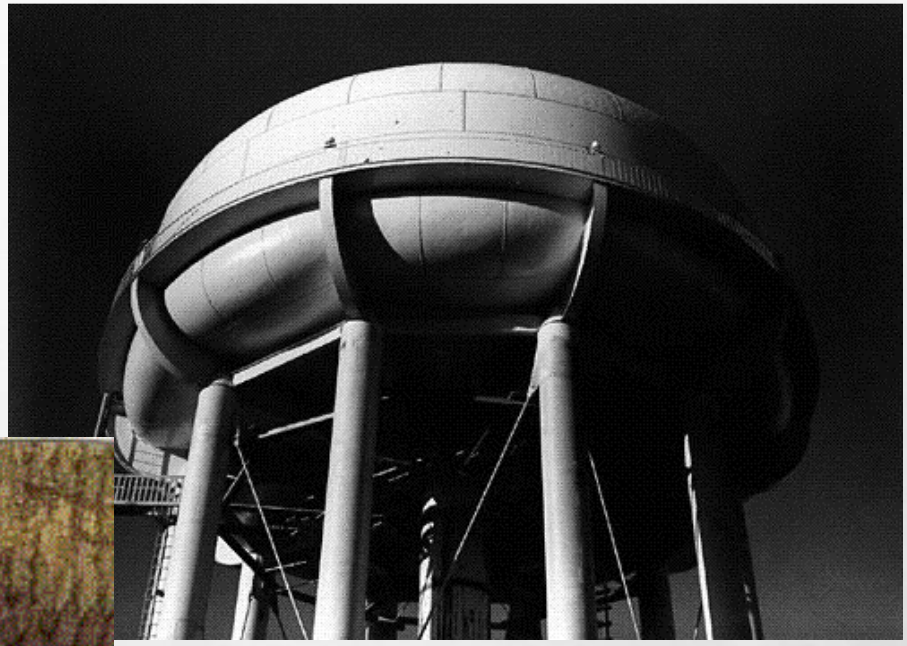
WHAT DOES A CONFINED SPACE LOOK LIKE?

- SILOS
- TANKS
- BINS
- VAULTS
- TUNNELS
- TRENCHES
- STORM SEWERS
- SANITARY SEWERS

SILOS



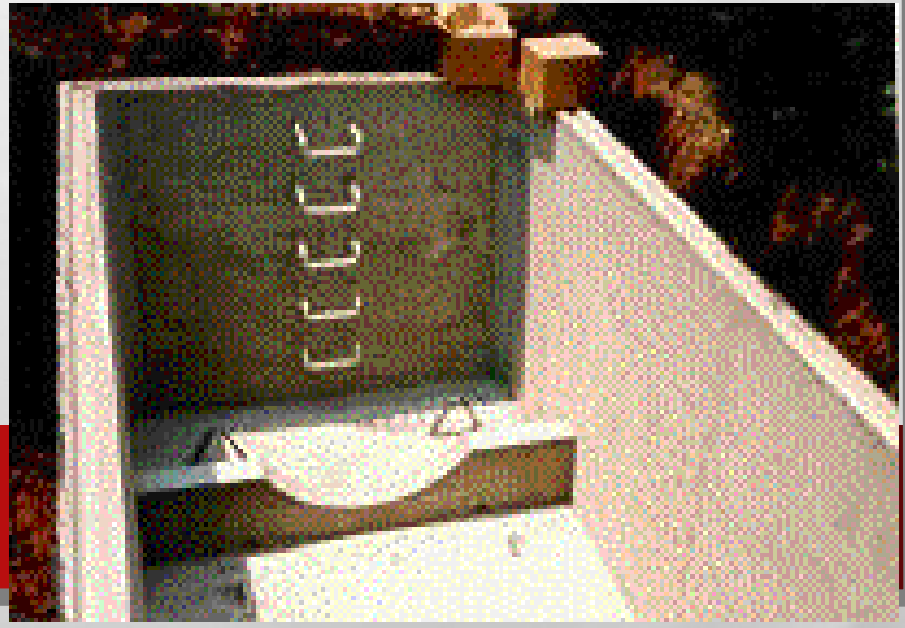
TANKS



BINS

SEWERS

VAULTS



TUNNELS

TRENCHES

CHARACTERISTICS

- INTERNAL CONFIGURATION
  - OPEN - NO OBSTACLES, BARRIERS OR OBSTRUCTIONS WITHIN SPACE (I.E. WATER TANK)
  - OBSTRUCTED - PERMIT SPACE CONTAINS SOME TYPE OF OBSTRUCTION THAT RESCUER WOULD NEED TO MANEUVER AROUND, SUCH AS BAFFLE OR MIXING BLADE
    - LARGE EQUIPMENT, SUCH AS LADDER OR SCAFFOLD BROUGHT INTO SPACE FOR WORK PURPOSES, WOULD BE CONSIDERED OBSTRUCTION IF POSITIONING OR SIZE OF EQUIPMENT WOULD MAKE RESCUE MORE DIFFICULT

CHARACTERISTICS

- ELEVATION
  - ELEVATED - PERMIT SPACE WHERE ENTRANCE PORTAL OR OPENING IS ABOVE GRADE ≥ 4 FT
    - USUALLY REQUIRES KNOWLEDGE OF HIGH ANGLE RESCUE PROCEDURES BECAUSE OF DIFFICULTY IN PACKAGING & TRANSPORTING PATIENT TO GROUND FROM PORTAL
  - NON-ELEVATED - PERMIT SPACE WITH ENTRANCE PORTAL LOCATED ≤ 4 FT ABOVE GRADE
    - WILL ALLOW RESCUE TEAM TO TRANSPORT INJURED EMPLOYEE NORMALLY

CHARACTERISTICS

- PORTAL SIZE
  - RESTRICTED - PORTAL ≤ 24” IN LEAST DIMENSION
    - TOO SMALL TO ALLOW RESCUER TO SIMPLY ENTER SPACE WHILE USING SCBA
    - TOO SMALL TO ALLOW NORMAL SPINAL IMMOBILIZATION OF INJURED EMPLOYEE
  - UNRESTRICTED - PORTAL ≥ 24” IN LEAST DIMENSION
    - THESE PORTALS ALLOW RELATIVELY FREE MOVEMENT INTO AND OUT OF PERMIT SPACE

CHARACTERISTICS

- SPACE ACCESS
  - HORIZONTAL - PORTAL LOCATED ON SIDE OF PERMIT SPACE
    - USE OF RETRIEVAL LINES COULD BE DIFFICULT
  - VERTICAL - PORTAL LOCATED ON TOP OF PERMIT SPACE; RESCUERS MUST CLIMB DOWN, OR AT BOTTOM OF PERMIT SPACE, RESCUERS MUST CLIMB UP TO ENTER SPACE
    - MAY REQUIRE KNOWLEDGE OF ROPE TECHNIQUES OR SPECIAL PATIENT PACKAGING TO SAFELY RETRIEVE DOWNED ENTRANT


quasar

ANY QUESTIONS

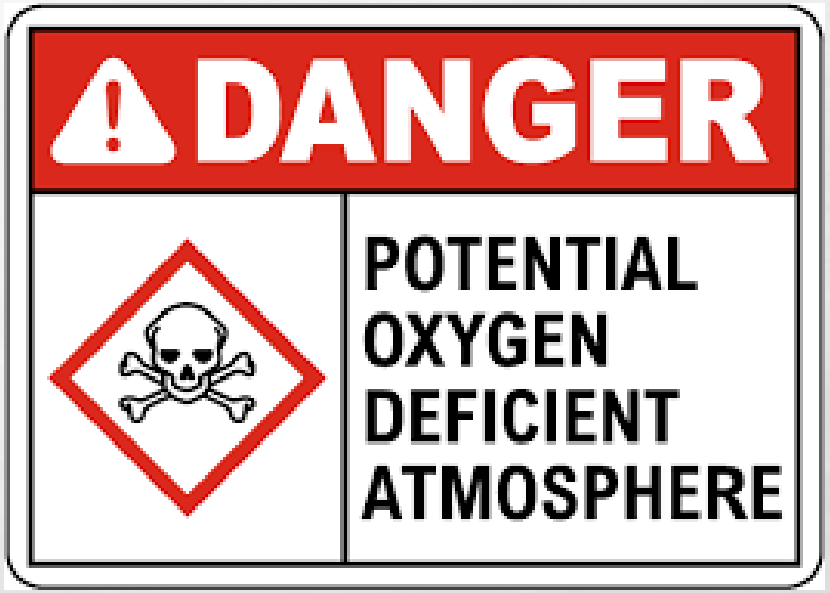

I NEED
BREAK TIME

OBJECTIVES FOR MODULE #2

AFTER THIS MODULE YOU SHOULD BE ABLE TO :

- IDENTIFY THE MOST COMMON CONFINED SPACE HAZARDS
- TAKE THE NECESSARY STEPS TO AVOID THOSE HAZARDS

- **OXYGEN DEFICIENCY**
- FLAMMABLE/COMBUSTIBLE GASES AND VAPORS
- TOXIC GASES
- ENGULFMENT IN SOLID OR LIQUID
- HIGH NOISE LEVELS
- GRINDING, CRUSHING, OR MIXING MECHANISMS
- CONFIGURATION
- EXTREME TEMPERATURES
- CHEMICALS
- LACK OF LIGHTING




DANGER
NITROGEN
Asphyxiation
Hazard Present.

- OXYGEN DEFICIENCY
- **FLAMMABLE/COMBUSTIBLE GASES AND VAPORS**
- TOXIC GASES
- ENGULFMENT IN SOLID OR LIQUID
- HIGH NOISE LEVELS
- GRINDING, CRUSHING, OR MIXING MECHANISMS
- CONFIGURATION
- EXTREME TEMPERATURES
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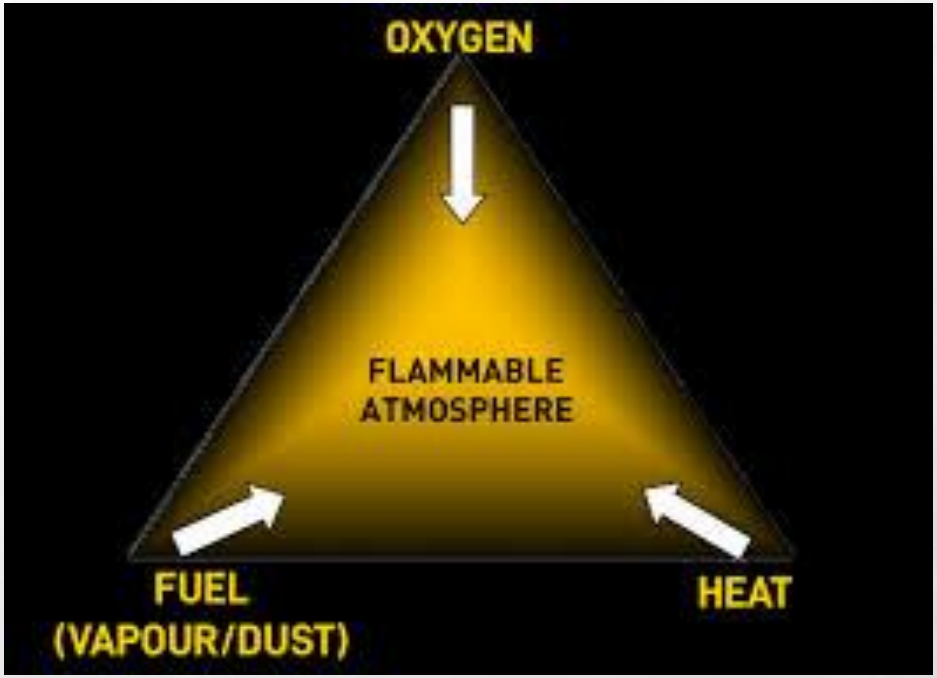
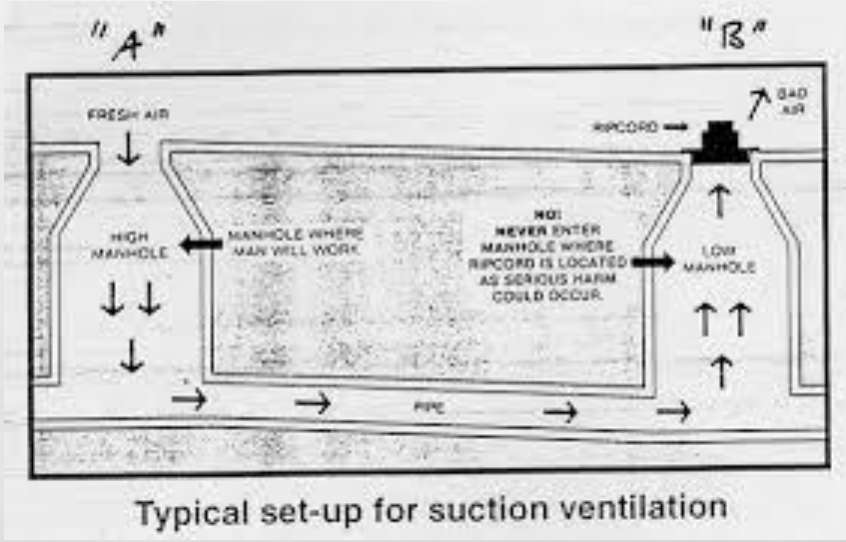



WOOSTER DIVISION OF FIRE


GAS TRANSPORT
14
EXIT
06/11/2020



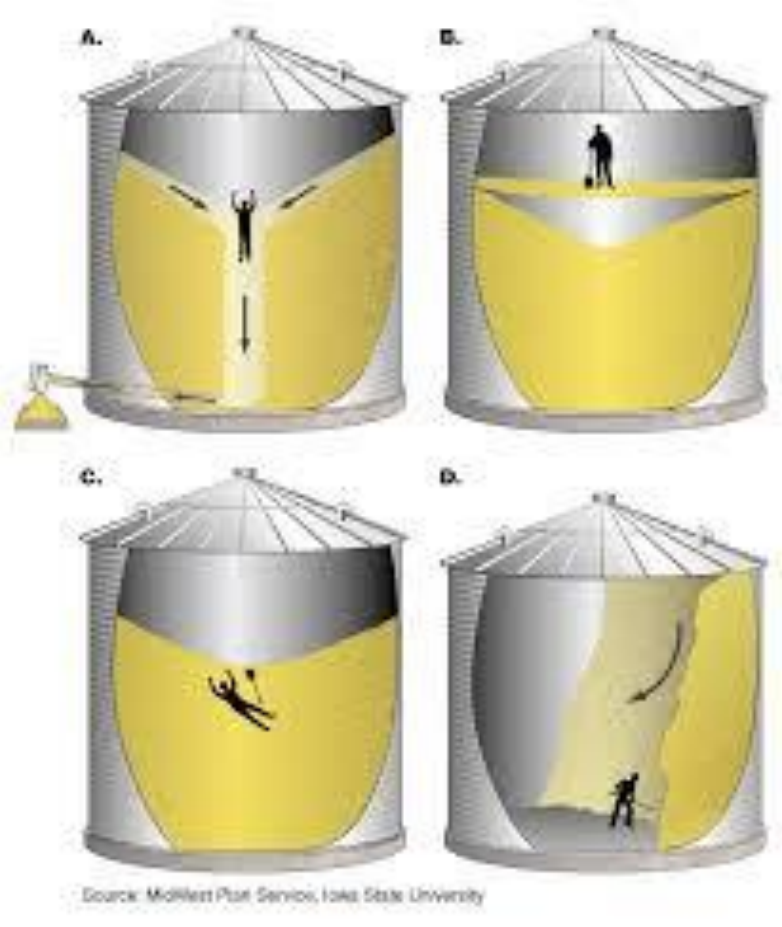
Typical set-up for suction ventilation

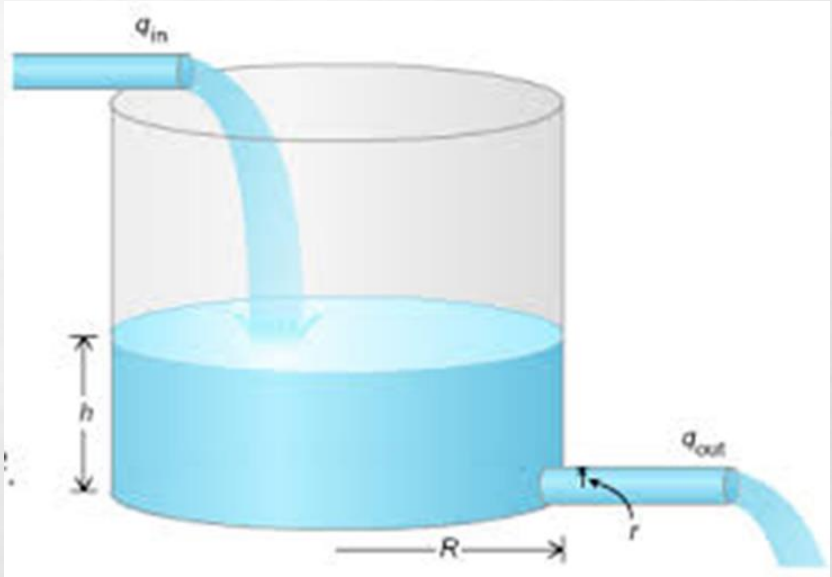
- OXYGEN DEFICIENCY
- FLAMMABLE/COMBUSTIBLE GASES AND VAPORS
- **TOXIC GASES**
- ENGULFMENT IN SOLID OR LIQUID
- HIGH NOISE LEVELS
- GRINDING, CRUSHING, OR MIXING MECHANISMS
- CONFIGURATION
- EXTREME TEMPERATURES
- CHEMICALS
- LACK OF LIGHTING


24
MSA
ALTAIR
H2S


2024
EMERGENCY RESPONSE
GUIDEBOOK

- OXYGEN DEFICIENCY
- FLAMMABLE/COMBUSTIBLE GASES AND VAPORS
- TOXIC GASES
- **ENGULFMENT IN SOLID OR LIQUID**
- HIGH NOISE LEVELS
- GRINDING, CRUSHING, OR MIXING MECHANISMS
- CONFIGURATION
- EXTREME TEMPERATURES
- CHEMICALS
- LACK OF LIGHTING


A.
B.
C.
D.
Source: Midwest Plan Service, Iowa State University


q_{in}
h
q_{out}
r
R


DANGER
COMBUSTIBLE
DUST
EXPLOSION HAZARD
SmartSign.com • 800-952-1457 • S-0268


DANGER
HIGH VOLTAGE
ELECTRICITY
DANGER
LOCKED
OUT

- OXYGEN DEFICIENCY
- FLAMMABLE/COMBUSTIBLE GASES AND VAPORS
- TOXIC GASES
- ENGULFMENT IN SOLID OR LIQUID
- **HIGH NOISE LEVELS**
- GRINDING, CRUSHING, OR MIXING MECHANISMS
- CONFIGURATION
- EXTREME TEMPERATURES
- CHEMICALS
- LACK OF LIGHTING


EAR PROTECTION
REQUIRED
WHEN THIS
EQUIPMENT
IS OPERATING


MAIN POWER DISCONNECT
ON
DANGER
HIGH VOLTAGE
OFF
LOCKED OUT

- OXYGEN DEFICIENCY
- FLAMMABLE/COMBUSTIBLE GASES AND VAPORS
- TOXIC GASES
- ENGULFMENT IN SOLID OR LIQUID
- HIGH NOISE LEVELS
- **GRINDING, CRUSHING, OR MIXING MECHANISMS**
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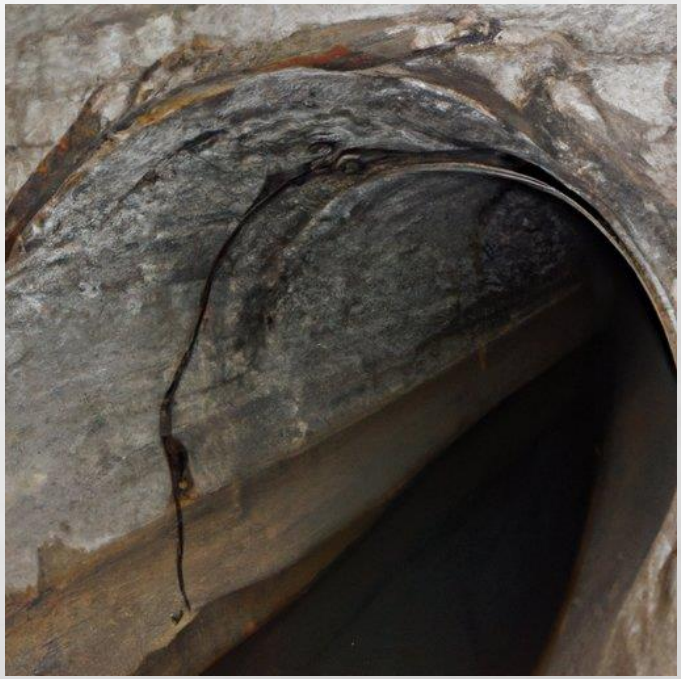

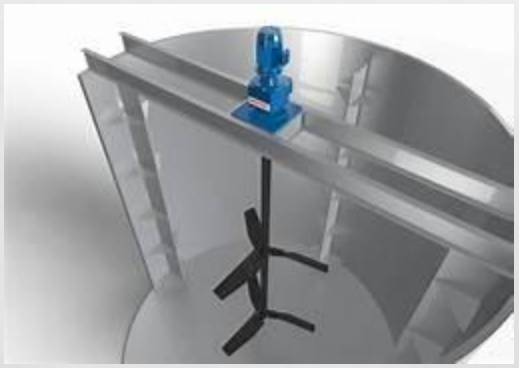


STOP
START


DANGER
LOCKED OUT
DO NOT REMOVE
DANGER
LOCKED OUT
DO NOT REMOVE
iN-SAFETY®


DANGER
DO NOT OPERATE

- OXYGEN DEFICIENCY
- FLAMMABLE/COMBUSTIBLE GASES AND VAPORS
- TOXIC GASES
- ENGULFMENT IN SOLID OR LIQUID
- HIGH NOISE LEVELS
- GRINDING, CRUSHING, OR MIXING MECHANISMS
- **CONFIGURATION**
- EXTREME TEMPERATURES
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- LACK OF LIGHTING

- OXYGEN DEFICIENCY
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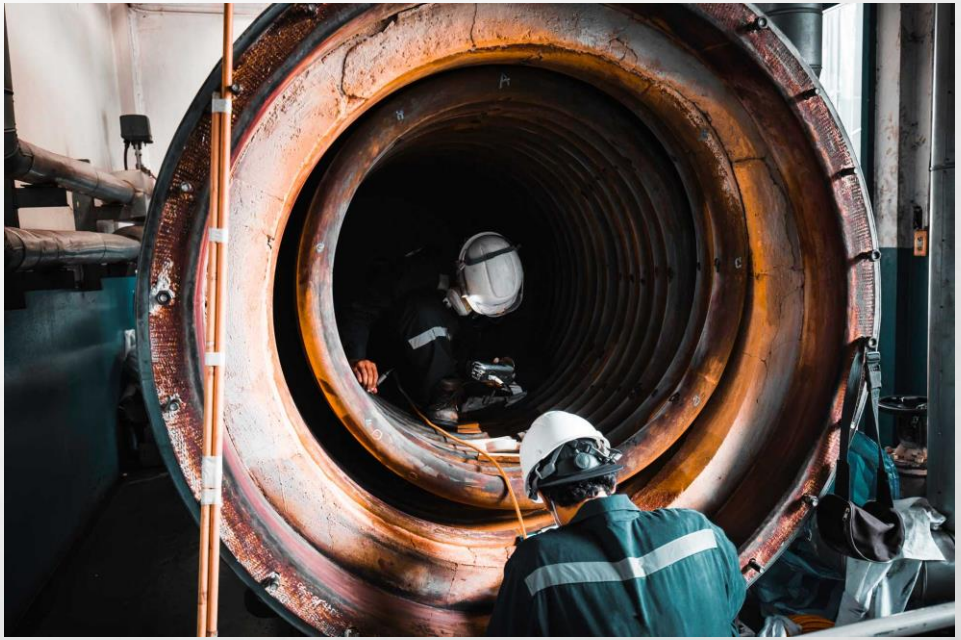
- CHEMICALS
- LACK OF LIGHTING




RANSOM

- OXYGEN DEFICIENCY
- FLAMMABLE/COMBUSTIBLE GASES AND VAPORS
- TOXIC GASES
- ENGULFMENT IN SOLID OR LIQUID
- HIGH NOISE LEVELS
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- CONFIGURATION
- EXTREME TEMPERATURES
- **CHEMICALS**
- LACK OF LIGHTING


PERMASTORE
TANKS & SILOS


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- OXYGEN DEFICIENCY
- FLAMMABLE/COMBUSTIBLE GASES AND VAPORS
- TOXIC GASES
- ENGULFMENT IN SOLID OR LIQUID
- HIGH NOISE LEVELS
- GRINDING, CRUSHING, OR MIXING MECHANISMS
- CONFIGURATION
- EXTREME TEMPERATURES
- CHEMICALS
- **LACK OF LIGHTING**

TAKE A BREAK

OBJECTIVES FOR MODULE #3

AFTER THIS MODULE YOU SHOULD BE ABLE TO :

- UNDERSTAND THE REQUIREMENTS OF ENTERING A PERMIT REQUIRED CONFINED SPACE
- KNOW THE NECESSARY PERSONNEL NEEDED TO ENTER THE SPACE
- UNDERSTAND WHAT HAPPENS IF SOMETHING GOES WRONG

REQUIRED PERSONNEL

WE WILL DISCUSS THE NEEDED PERSONNEL FOR A CONFINED SPACE ENTRY AND THEIR RESPONSIBILITIES.

ATTENDANT

- INDIVIDUAL STATIONED OUTSIDE ONE OR MORE PERMIT SPACES WHO MONITORS AUTHORIZED ENTRANTS & PERFORMS ALL ATTENDANT'S DUTIES ASSIGNED IN EMPLOYER'S PERMIT SPACE PROGRAM

DUTIES OF ATTENDANTS

- KNOWS HAZARDS THAT MAY BE FACED DURING ENTRY
- AWARE OF POSSIBLE BEHAVIORAL EFFECTS OF HAZARD EXPOSURE IN AUTHORIZED ENTRANTS
- CONTINUOUSLY MAINTAINS ACCURATE COUNT OF AUTHORIZED ENTRANTS
- REMAINS OUTSIDE PERMIT SPACE DURING ENTRY OPERATIONS UNTIL RELIEVED BY ANOTHER ATTENDANT

DUTIES OF ATTENDANTS

- COMMUNICATES WITH AUTHORIZED ENTRANTS
- MONITORS ACTIVITIES INSIDE & OUTSIDE SPACE
- SUMMONS RESCUE & OTHER EMERGENCY SERVICES
- PERFORMS NON-ENTRY RESCUES AS SPECIFIED BY EMPLOYER'S RESCUE PROCEDURE
- PERFORMS NO DUTIES THAT MIGHT INTERFERE WITH PRIMARY DUTY TO MONITOR & PROTECT AUTHORIZED ENTRANTS

AUTHORIZED ENTRANT

- EMPLOYEE AUTHORIZED BY EMPLOYER TO ENTER PERMIT SPACE

DUTIES OF AUTHORIZED ENTRANTS

- KNOW HAZARDS THAT MAY BE FACED DURING ENTRY, INCLUDING INFORMATION ON MODE, SIGNS OR SYMPTOMS & CONSEQUENCES OF EXPOSURE
- PROPERLY USE EQUIPMENT AS REQUIRED BY PARAGRAPH (D)(4)
- COMMUNICATE WITH ATTENDANT AS NECESSARY TO ENABLE ATTENDANT TO MONITOR ENTRANT STATUS & ENABLE ATTENDANT TO ALERT ENTRANTS OF NEED TO EVACUATE SPACE AS REQUIRED BY PARAGRAPH (I)(6)

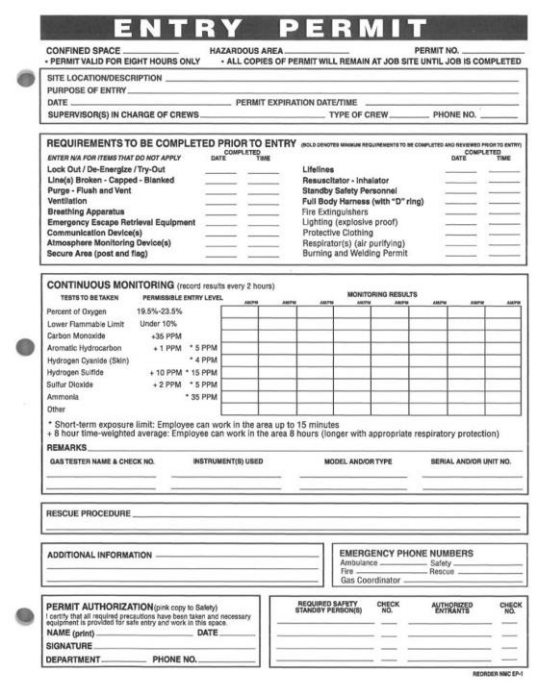
DUTIES OF AUTHORIZED ENTRANTS

- ALERT ATTENDANT WHENEVER:
  - ENTRANT RECOGNIZES ANY WARNING SIGN OR SYMPTOM OF EXPOSURE TO DANGEROUS SITUATION
  - ENTRANT DETECTS PROHIBITED CONDITION
  - EXIT FROM PERMIT SPACE AS QUICKLY AS POSSIBLE WHENEVER:

DUTIES OF AUTHORIZED ENTRANTS

- EXIT FROM PERMIT SPACE…
  - ORDER TO EVACUATE IS GIVEN BY ATTENDANT OR ENTRY SUPERVISOR
  - ENTRANT RECOGNIZES ANY WARNING SIGN OR SYMPTOM OF EXPOSURE TO A DANGEROUS SITUATION
  - ENTRANT DETECTS PROHIBITED CONDITION
  - EVACUATION ALARM ACTIVATED

ENTRY SUPERVISOR



ENTRY PERMIT

CONFINED SPACE _____ HAZARDOUS AREA _____ PERMIT NO. _____

• PERMIT VALID FOR EIGHT HOURS ONLY • ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

SITE LOCATION/DESCRIPTION _____

PURPOSE OF ENTRY _____

DATE _____ PERMIT EXPIRATION DATE/TIME _____

SUPERVISOR(S) IN CHARGE OF CREWS _____ TYPE OF CREW _____ PHONE NO. _____

REQUIREMENTS TO BE COMPLETED PRIOR TO ENTRY (BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED AND REVIEWED PRIOR TO ENTRY)

ENTER N/A FOR ITEMS THAT DO NOT APPLY — COMPLETED: DATE / TIME

Lock Out / De-Energize / Try-Out			Lifelines		
Line(s) Broken - Capped - Blanked			Resuscitator - Inhalator		
Purge - Flush and Vent			Standby Safety Personnel		
Ventilation			Full Body Harness (with "D" ring)		
Breathing Apparatus			Fire Extinguishers		
Emergency Escape Retrieval Equipment			Lighting (explosive proof)		
Communication Device(s)			Protective Clothing		
Atmosphere Monitoring Device(s)			Respirator(s) (air purifying)		
Secure Area (post and flag)			Burning and Welding Permit		

CONTINUOUS MONITORING (record results every 2 hours)

TESTS TO BE TAKEN	PERMISSIBLE ENTRY LEVEL	MONITORING RESULTS
Percent of Oxygen	19.5%-23.5%	
Lower Flammable Limit	Under 10%	
Carbon Monoxide	+35 PPM	
Aromatic Hydrocarbon	+ 1 PPM * 5 PPM	
Hydrogen Cyanide (Skin)	* 4 PPM	
Hydrogen Sulfide	+ 10 PPM * 15 PPM	
Sulfur Dioxide	+ 2 PPM * 5 PPM	
Ammonia	* 35 PPM	
Other		

* Short-term exposure limit: Employee can work in the area up to 15 minutes
+ 8 hour time-weighted average: Employee can work in the area 8 hours (longer with appropriate respiratory protection)

REMARKS _____

GAS TESTER NAME & CHECK NO. | INSTRUMENT(S) USED | MODEL AND/OR TYPE | SERIAL AND/OR UNIT NO.

RESCUE PROCEDURE _____

ADDITIONAL INFORMATION _____

EMERGENCY PHONE NUMBERS
Ambulance _____ Safety _____
Fire _____ Rescue _____
Gas Coordinator _____

PERMIT AUTHORIZATION (pink copy to Safety)
I certify that all required precautions have been taken and necessary equipment is provided for safe entry and work in this space.
NAME (print) _____ DATE _____
SIGNATURE _____
DEPARTMENT _____ PHONE NO. _____

REQUIRED SAFETY STANDBY PERSON(S)	CHECK NO.	AUTHORIZED ENTRANTS	CHECK NO.

REORDER NMC EP-1

- PERSON (SUCH AS EMPLOYER, FOREMAN OR CREW CHIEF) RESPONSIBLE FOR DETERMINING IF ACCEPTABLE ENTRY CONDITIONS ARE PRESENT AT PERMIT SPACE WHERE ENTRY IS PLANNED, FOR AUTHORIZING ENTRY & OVERSEEING ENTRY OPERATIONS & FOR TERMINATING ENTRY

DUTIES OF ENTRY SUPERVISOR

- KNOWS HAZARDS THAT MAY BE FACED DURING ENTRY, INCLUDING INFORMATION ON MODE, SIGNS OR SYMPTOMS & CONSEQUENCES OF EXPOSURE
- VERIFIES, BY CHECKING THAT APPROPRIATE ENTRIES HAVE BEEN MADE ON PERMIT, ALL TESTS SPECIFIED BY PERMIT HAVE BEEN CONDUCTED & ALL PROCEDURES & EQUIPMENT SPECIFIED BY PERMIT ARE IN PLACE BEFORE ENDORSING PERMIT & ALLOWING ENTRY TO BEGIN
- TERMINATES ENTRY & CANCELS PERMIT AS REQUIRED BY PARAGRAPH (E)(5)

DUTIES OF ENTRY SUPERVISOR

- VERIFIES THAT RESCUE SERVICES ARE AVAILABLE & MEANS FOR SUMMONING ARE OPERABLE
- REMOVES UNAUTHORIZED INDIVIDUALS WHO ENTER OR ATTEMPT TO ENTER PERMIT SPACE DURING ENTRY OPERATIONS
- DETERMINES, WHENEVER RESPONSIBILITY FOR PERMIT SPACE ENTRY OPERATION IS TRANSFERRED & AT INTERVALS DICTATED BY HAZARDS & OPERATIONS PERFORMED WITHIN SPACE, THAT ENTRY OPERATIONS REMAIN CONSISTENT WITH TERMS OF ENTRY PERMIT & ACCEPTABLE ENTRY CONDITIONS ARE MAINTAINED

LETS DO THIS

ENTERING THE SPACE

THINGS TO KNOW BEFORE ENTRY

WHAT

WHERE

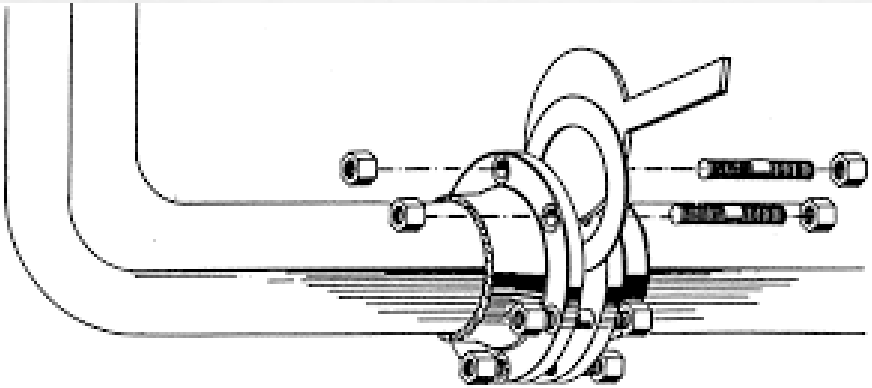
WHY

THINGS TO KNOW BEFORE ENTRY

WHAT ARE THE EQUIPMENT NEEDS FOR ENTRY

WHAT ARE THE EQUIPMENT NEEDS FOR THE MAINTENANCE

MAKE THE SPACE SAFE



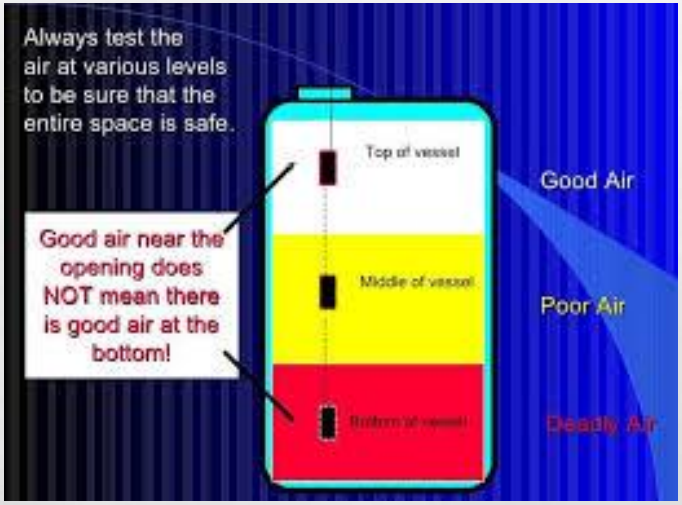
Blank (or blind)

MAKE THE SPACE SAFE

AIR MONITORING

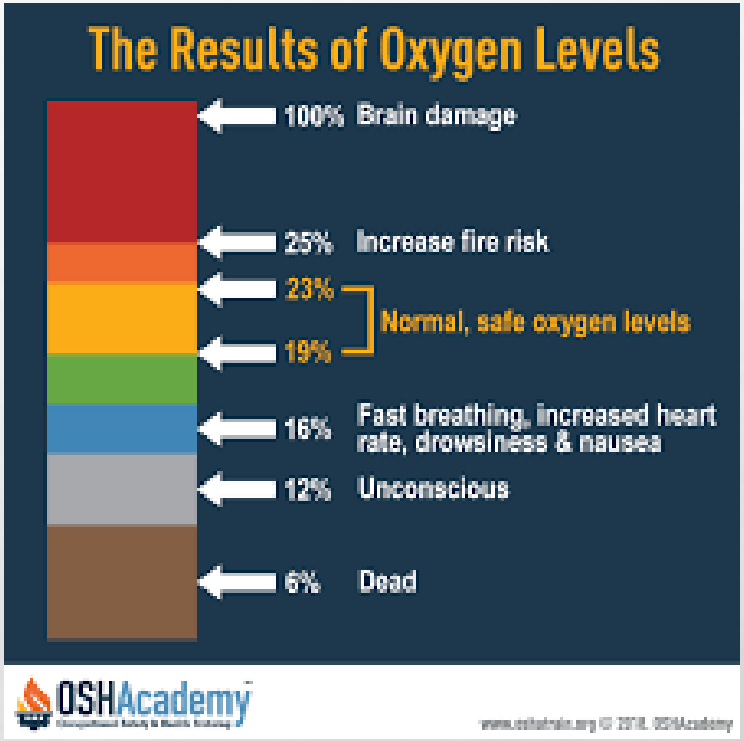
MAKE THE SPACE SAFE
AIR MONITORING

MONITOR



VENTILATION

MAKE THE SPACE SAFE AIR MONITORING



MAKING ENTRY

GETTING THE WORK DONE

HOW IS THIS CHANGING OUR ENVIRONMENT?

CONTINUES MONITORING OF THE SPACE

SOMETHING HAS GONE WRONG

A DISCUSSION ON THE PROCEDURES FOR SELF OR NONENTRY RESCUE

SOMETHING HAS GONE WRONG.

WHAT TO EXPECT AND WHO TO EXPECT IT FROM.

ANY QUESTIONS