

CONFINED SPACE ENTRY... ENTERING THE SPACE

COURSE OUTLINE

- **Hazardous atmospheres in confined spaces can be lethal.**
 - Not only can they kill “Entrants”, but they can also be fatal to people who rush in to rescue or assist them.
- **Hazardous atmospheres typically can’t be identified with the naked eye.**
 - So testing for them is essential in determining what safeguards should be put in place before anyone enters a confined space.
- **The first test that OSHA requires measures oxygen levels.**
 - Having either too much or too little oxygen can make an atmosphere hazardous.
 - When levels measure below 19.5 percent, a person can't breathe in enough oxygen to do physical work safely.
 - Oxygen levels above 23.5 percent can significantly increase the risk of a spark or other ignition source causing a fire or explosion.
- **After testing for oxygen is completed, the space needs to be tested for flammable gases and vapors that can burst into flames or become explosive if they build up in a confined area such as...**
 - Methane.
 - Acetylene.
 - Carbon disulfide.
 - Gasoline.
- **If tests show that a gas or vapor has reached a concentration greater than ten percent of its "lower flammable limit" ("LFL") then the space must be ventilated for anyone to work in it.**
- **"Combustible dusts" can present a similar hazard when their concentrations reach or exceed their LFLs (Lower Flammable Limit).**
 - So testing must be performed to accurately judge whether there is a dust concentration that is unsafe as well.

- **The last test that must be conducted before entering a confined space looks for toxic contaminants in the space's atmosphere.**
 - Carbon monoxide and hydrogen sulfide are the two most commonly encountered contaminants, but a number of others need to be tested for as well.
 - Breathing in these substances can cause confusion, nausea and vomiting, loss of consciousness... even death.
- **So to ensure the ongoing safety of the people who are entering a space, this atmospheric testing must continue throughout the entry.**
 - The results and times of the initial and subsequent tests should be recorded on the space's Entry Permit.
- **There's no doubt about it... confined spaces can be dangerous places.**
 - But there are a number of things you and your company can do to make it as safe as possible to enter them.
- **To start, a Permit-Required Confined Space Program sets out specific safety procedures to follow that can reduce risks before anyone goes inside.**
 - Some of these procedures involve testing the space for hazards.
 - If anything is found, continuous forced-air ventilation must be used to clear the air.
- **Unfortunately, ventilation alone won't always protect Entrants from toxic gases and vapors.**
 - In these cases, an Entry Permit may require them to wear respirators or a self-contained breathing apparatus.
- **Even if tests show that the atmosphere isn't hazardous to begin with, some tasks can cause caked-on residues to boil off and release toxic or flammable gases into the air, including...**
 - Welding.
 - Riveting.
 - Cutting.
 - Burning.
 - Heating.
- **Because of this, written authorization for any of these activities must be provided by the employer in the form of a "Hot Work Permit".**

- **Some confined spaces contain equipment and heavy moving parts that could trap or crush an Entrant, or energized components that could cause electrocution, burns or other injuries.**
 - In these cases, all sources of energy should be shut off, and all mechanical linkages blocked before anyone enters the space.
- **Lockout/tagout procedures must be strictly followed as well.**
 - This can help to reduce the potential of someone restoring the power while the entry is in progress.
 - If you have questions about electrical safety in a space you're working with, ask your supervisor.
- **Even with all of these precautions, emergencies can still happen in a confined space.**
 - So it is also important that rescue equipment like harnesses, head lamps, rope and helmets be kept nearby.
- **When it comes to confined space entry, the last thing you want it to be is unpredictable.**
 - So your Permit-Required Confined Space Entry Program should have step-by-step instructions for any confined space project.
- **First, the space's Entry Supervisor must make sure that rescue services are standing by.**
 - You should also verify that the systems that are used to contact them are working.
- **The Supervisor will then check the Entry Permit to verify that...**
 - All of the required tests have been conducted.
 - All appropriate procedures and equipment are in place.
 - No conditions exist that the Permit prohibits.
- **After the Supervisor signs off on the Permit, the entry can begin.**
 - As the operation proceeds, they will also ensure that no unauthorized individuals enter the space.
- **The Supervisor will monitor the progress of the job as well.**
 - They ensure that the Entrants are following the steps described in the Permit-Required Confined Space Program.

- **If hazards develop at any time, the Supervisor will...**
 - Stop the work.
 - Evacuate the space.
 - Suspend or cancel the Permit.
- **But what about the personnel who are actually entering a space to do the work?**
 - The "Entrants" have steps to follow, too.
- **If you are an Entrant, you will be trained regarding how to...**
 - Put up barriers and shields around entry points.
 - Install forced-air ventilation systems if needed.
 - Use ladders and other gear for entering and exiting a space.
 - Work with lighting equipment, including the explosion-proof varieties that are used in potentially flammable atmospheres.
- **Your training will also cover...**
 - The proper use of personal protective equipment.
 - How to monitor the air quality while you are inside a space.
 - The evacuation alarms which are on automatic monitoring devices (so you'll know when to get out).
- **As for PPE, Entrants typically wear a chest or full-body harness with a retrieval line attached at the center of the back.**
 - If conditions inside the confined space make wearing a harness impractical or dangerous, the lines can be attached to wristlets or anklets instead.
- **The other end of the retrieval line should always be attached to a fixed point outside the entrance.**
 - If the space is over five feet deep, it should be attached to a retrieval device such as a tripod and winch.
 - These "non-entry" rescue systems enable the Attendant or other personnel to pull you out if you become incapacitated... without also putting themselves at risk.
- **Communication between Entry Team members is very important.**
 - So Entrants are also trained to use communication equipment such as walkie-talkies to stay in touch with the space's Attendant and Supervisor.

- **You'll be responsible for updating them on the status of the entry.**
 - This involves letting them know if you notice any hazards developing while you are in the space.
 - You also have to be able to receive an evacuation order from either the Attendant or the Entry Supervisor, in case of an emergency.
- **An “Attendant” is an essential part of any confined space entry operation.**
 - If you are designated as one, you will have very different duties from Entrants.
 - For one thing, you normally won't enter the confined space yourself.
- **It is your job to stay by the entrance and monitor what goes on both inside and outside of the space.**
 - This allows you to make quick, informed decisions about whether it's safe for the entry to continue... or if the work should be stopped and the Entrants evacuated.
- **You should immediately order the evacuation of a space when...**
 - A new hazard develops.
 - You notice that an Entrant is showing symptoms of oxygen deprivation or exposure to toxic substances.
- **So it's critical for you to be able to recognize when an Entrant may have been exposed to elevated toxicity or low oxygen levels. Signs of these conditions can include...**
 - Confusion.
 - Dizziness.
 - Difficulty concentrating.
 - Loss of consciousness.
- **Attendants also need to know the Entry Permit well, because if a "prohibited condition" arises, that will require an evacuation, too.**
 - You must also keep track of the number of Entrants in a space, so they can all be accounted for if something happens.
- **As you can see, an Attendant can be a very busy person.**
 - And you may also need to perform other tasks such as handing tools to Entrants or warning unauthorized personnel away from the operation.
 - But these activities must never interfere with your ability to monitor entry personnel and watch out for problems.

- **If at any time you feel you cannot safely and effectively perform all of your assigned duties, you should stop the work and get the Entrants out of the space.**
 - If an emergency does occur when there are Entrants in a space and they need help to escape, you should call for rescue services immediately.
- **It's also important to remember that whenever a Permit-Required Confined Space is evacuated, there must be an investigation to find out what went wrong.**
 - Only after steps have been taken to prevent the situation from occurring again can the job be resumed.
 - In this case, a new Entry Permit must be filled out and signed by the Entry Supervisor before anyone goes back into the space.

*** * * SUMMARY * * ***

- **Before anyone enters a “Confined Space”, its atmosphere must be tested to determine its oxygen levels, and if any hazardous materials or gases exist within it.**
- **If the oxygen levels in a confined space fall below 19.5%, or rise above 23.5%, the space isn’t safe to work in.**
- **Anyone entering a confined space must obtain the permits they need and wear appropriate PPE.**
- **Locking and tagging out any sources of energy, and knowing the evacuation procedures that should be followed in case of an emergency, are crucial steps for a safe entry.**
- **During a confined space entry, Entrants should use walkie-talkies or another mode of communication to stay in contact with the space’s Entry Supervisor and Attendant.**
- **An Attendant should always keep an eye out for any signs that an Entrant is experiencing oxygen deprivation or increased exposure to other confined space hazards.**
- **Confined space entry can be daunting, but with the right team and safety protocols, you can keep yourself and your coworkers safe no matter where you are... every day!**