

Confined Space – Breakdown

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We have all read the article or saw the post on the questions regarding Confined Spaces such as “What is a Confined Space?” or “What makes your Confined Space Permit Required?” You might have even been asked “How do you re-classify a Permit Required Confined Space?” or one of my favorites, “When do I need a Rescue Team at my Confined Space?” These are the more popular questions that seem to always pop up but if they are so popular, why do they keep resurfacing? Let’s break it all down and see how we can answer them.

“What is a Confined Space?” A Confined Space according to OSHA is a space that is large enough for an employee to bodily enter and perform work AND has limited or restricted means of entry or exit AND is not designed for continuous human occupancy. We have all heard this, read this, and been told this but what really does it mean? It is any tank, vessel, silo, storage bin, hopper, vault, pit, manhole, duct, crawl space, pipe, or void that is not supposed to have a person inside it normally. This simple definition does not say anything about toxic atmospheres or engulfment hazards or anything else that could be dangerous and only states what a Confined Space is. In reality, it can be brand new, it may never have had anything stored inside, and it might hold drinking water or even be completely empty and yet still be classified as a Confined Space. Having a Hazardous Atmosphere inside of the Confined Space is irrelevant at this point of the evaluation to simply determine what a Confined Space is per OSHA. From my understanding of other areas of the World, there is a similar thought process to what exactly is a Confined Space. Although there may be some differences, the overall concept appears to be that of which OSHA identifies.

After identifying the Confined Space, we need to assess whether or not the space is Permit Required or Non-Permit Required. OSHA is pretty clear exactly what is Permit Required and what is not but the simple question of **“What makes your Confined Space Permit Required?”** continues to surface. Your Confined Space becomes Permit Required IF; it contains or has the potential to contain a hazardous atmosphere, OR; if it contains a material that has the potential for engulfing an Entrant, OR; if it has an internal configuration that could cause an Entrant to become trapped or asphyxiated, OR; if it contains any other recognized serious safety and health hazard. IF ANY of those four items listed above occur, your Confined Space is now Permit Required! I can tell you from experience that the majority of Confined Spaces are Permit Required simply because the space contains or has the potential to contain a Hazardous

Atmosphere. The key words to note are **contains** and **potential**. Contains means that it is present, it is in there, you know it is there. The word potential means that there is a possibility it can be in there or it could show up after entry has been made. Maybe it shows up due to the actions of the Entrant and their work assignment through a chemical or cleaning process or hot work that depletes the oxygen. The last possibility for a Permit Required Confined Space is also one that makes many Confined Spaces to become Permit Required. The statement **“If it contains any other recognized serious safety and health hazard”** opens up the door to many problems. This situation changes many normal Confined Spaces to be Permit Required because of the types of injuries that can occur. Fire hazards, explosions, dust, extreme temperatures, slips and falls, and machinery also increase your safety and health exposures. While statistics have shown that many of the fatalities that occur in Confined Spaces are directly attributed to an atmospheric problem, serious injuries are also a very real potential.

So now that those basic questions have been answered we are commonly asked **“How do we re-classify a Permit Required Confined Space?”** In order to re-classify the Permit Required Confined Space to a Non-Permit Confined Space, employers must ensure that the space does not contain or, with respect to atmospheric hazards, have the potential to contain ANY hazard capable of causing death or serious physical harm. The ability for an employer to re-classify a Permit Required Confined Space is very difficult but not impossible. If you look at the definitions of Non-Permit and Permit Required, the Non-Permit space has eliminated, removed and ensured that there are NO hazards present. In my professional opinion, this is very difficult to achieve. OSHA takes this one step further and states in the standard that in order to re-classify a Permit Space the space must pose no actual or potential atmospheric hazards and that all hazards within the space can be eliminated without making entry. It even mentions in a foot note that “control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards. After the decision and confirmation to re-classify the space has been completed, the employer must issue a certificate to be posted. This written certificate shall provide the date, the location of the space and the signature of the person making the determination that the space is to be re-classified. This certificate shall be made available to all Entrants or their designated representatives. The lack of a re-classified space certificate is by far the biggest violation that I personally observe while working with employers. The objective is to have a Confined Space that is hazard free AND that you are willing to put in writing that such exists and what you did to ensure that. I also want to point out that many Confined Spaces are not properly classified from the start which would obviously make it very difficult to properly re-classify it. So now the real question...is it possible to re-classify a Permit Required Confined Space? Yes, but I believe that it is very difficult and I also believe that the instances of occurrence are few.

After figuring out all of the basics, rescue comes in to play. **“So when do I need a Rescue Team at my Confined Space?”** Rescue should first be addressed in the required Permit Required Confined Space written program. It is here that employees are given the details and requirements of the OSHA standard and also the company specific requirements for working in or around Confined Spaces. In reality, you cannot expect that OSHA is able to identify when specifically that you need a rescue team. The OSHA standard is not so clear as to say that “in this situation, Rescue is mandatory” because each space is different. As for specifics on what the OSHA regulations say for rescue, you need to look at the Preamble and interpretations. Looking at the requirements for a Rescue team under Part K of 1910.146 should lead you into the direction of whether or not rescue is needed at your Confined Space. Your Rescue plan needs to identify whether it will be a Self-Rescue, Assisted Rescue or Entry Rescue. OSHA also makes it very clear that Entrants should leave the space if they detect a problem or prohibited condition or even if directed to leave. This is Self-Rescue. It is also very clear that a mechanical retrieval device is required for Entrants in Permit Required Confined Spaces that are deeper than 5 feet vertically. If employees are aggressively monitoring and working a Confined Space correctly, the employee should receive ample notice as to when they must exit the space under their own power. A Self Rescue must proactively look at providing aggressive air monitoring and detailed Permit completion for all spaces. This is the true meaning of Self-Rescue.

“How can I perform a rescue?” If the Entrant is hooked up to a mechanical retrieval device and something goes wrong, the Attendant can retrieve them from the space, without making entry. We have just bypassed the proactive approach and are now in a reactive state. This is called Assisted Rescue. Assisted Rescue is only going to work if the Entrant remains hooked up to the retrieval device AND there is the ability to retrieve them safely. Attendants should not be making entry in during an Assisted Rescue due to the fact that both the Entrant and Attendant would be exposed to the same possible hazard. The final option and last resort is where something catastrophic has occurred and a Rescue Team must make a physical entry in order to retrieve the Entrant. This is a Go Rescue or Entry Rescue. A Go Rescue must be a last step effort as it is a very dangerous activity requiring extensive training, practice and equipment. You are talking about putting another worker into an already dangerous situation to retrieve the original Entrant from a hazard that already should have been addressed already. A key thing to remember is that both Assisted Rescue and Entry Rescue have a very real problem that is happening right now! There are hazards, there are problems, there is danger and your Entrant is in the middle of it. Don’t make it worse! With an Entry Rescue, your entry team is now in the middle of the same mess and exposing the Entry Rescue Team to some deadly situations! Ideally, we should not want to make entry, we should want to bring the person out of the space to us and to safety!

If self-rescue is not an option and a worker must be assisted out of the space, how can it be performed if the worker is not connected to a retrieval device? OSHA mandates that in a PRCS deeper than 5 feet that there is a means of mechanical advantage to retrieve a worker. In my experience, so many workers immediately disconnect from their tether once inside. Why? I hear such excuses as “I didn’t want to be tied down”, “It hindered me from working”, “It kept getting tangled around me”. It may be uncomfortable for you to be tethered all the time but failure should not be an option. You are really limited to options if the worker is disconnected but one way to possibly reconnect a retrieval system is to use a reach pole. Yates Company makes a rescue pole that uses a carabineer to connect the retrieval device to the Entrant. The carabineer and pole are lowered into the space and using the open carabineer you simply snag the D ring on their harness. It is not always easy but it is a tool in the box and prevents a rescuer from having to make an entry. What is your plan to prevent an employee from disconnecting while making entry? Have you practiced your plan? What about your PRCS written program, does it address disconnecting? OSHA says an Entrant can only disconnect when it creates a greater hazard. Is it really a greater hazard to be inconvenienced or to die? Unless you want to traverse into an Entry Rescue, do not allow your Entrants to disconnect. EVER!

“What is required with a Permit?” No one likes paperwork but this is one time that a worker should not skimp on procedures. A permit should always be filled out since it is a true checks and balance approach to safety. It documents what you did and also what you are currently doing. Use it as a checklist to ensure that you have covered everything correctly and that you did not miss something. The permit ask questions and based upon the reply should lead you to a safe solution. The permit must be posted at the point of entry for all those involved to see. Sadly, I see many times where a permit is not available and also when it is not completed properly. In the OSHA regulations, employees and their representatives are given the option of observing monitoring and they also should be involved in the permit completion process. I always ask employees involved in Confined Space work what was on the permit. Who is the Entrant? Who signed the permit? What special equipment or procedure must I do? What are my atmospheric readings? The permit is a living and breathing document that is continually updated as new monitoring data is obtained. OSHA minimally requires the permit be updated every 2 hours but requires the monitor running continuously while in a PRCS. I strongly encourage the permit to be updated every 15 minutes of the atmospheric results so that any change in conditions can be much more quickly identified. It takes less than 10 seconds for an employee to look at their monitor, give the results verbally and to transcribe that data to a sheet. Remember it is a living and breathing document if you will.

Atmospheric monitoring is a vital part of the Permit process and should be the first step to properly evaluating a Confined Space. **“So what does air monitoring require?”** OSHA requires that atmospheric monitoring be performed initially and just prior to entry. Initially is to perform a thorough assessment of the space and to evaluate all the possibilities that may be in the space atmospherically at least. Prior to entry is completed after the initial and just as implied, prior to entry. This test is to give a final check to ensure that the air is safe for entry. The reality is that some time has elapsed since the initial monitoring and making entry so there needs to be a quick check to ensure that it is still safe. It is also required to check for Oxygen levels first as it is the primary source of life. Secondly we check for flammable gas or vapors since those things can explode or engulf the space in flames. Lastly we check for toxic hazards such as Carbon Monoxide, Hydrogen Sulfide, Sulfur Dioxide, Nitrogen etc. The real hazard with atmospheres is that you cannot see a hazard. Air looks like air. It is clear, without recognition and very much an unknown. The only way to know if a hazard exists in the atmosphere is to monitor the air since we cannot see if the air is hazardous. Another requirement is that the space must be monitored every 4 feet both vertically and horizontally. Think of a bubble around the monitor and that is what it is reading not the entire air space. Take the readings and then move to that level and take additional readings. Monitor, move. Monitor, move. Another problem with air monitoring is the response time of the manufacturer. How long does the manufacturer require air to draw across a sensor in order to give an accurate reading? What if you are using a sampling hose of 20 feet, how long will it take now? What about with a battery pump verses a hand pump? All things that must be considered with the atmosphere in order to give an accurate understanding to those in or around a Confined Space.

“What are some best practices that are tried and true?” I teach and also believe that there are 5 Life Safety Principles that will offer the Entrant the best chance of survival while working in a Confined Space. First, continuous air monitoring should be performed in all Confined Spaces and not just in a Permit Required Confined Space. We cannot determine any change in the atmosphere if we are not monitoring continuously. I believe this to be the first priority in Confined Space work and the one task that offers the best level of employee protection. Second, all Entrants into a Confined Space must be hooked to a mechanical advantage retrieval system at all times. When something goes bad, no one has the ability to magically attach the retrieval device to a downed Entrant and bring you to safety. Third, fresh air should be provided in all Confined Space entries and that supply needs to be monitored to ensure it is safe. Simply creating a positive pressure atmosphere in the Confined Space can help keep contaminants from creating a problem. Just remember that garbage in is garbage out so know the air source. Fourth, all Entrants should have with them an Emergency Escape Air Bottle to allow them the ability to Self-Rescue AND have the

time to do such by the provided breathing air. These simple devices can provide either 5 or 10 minute air bottles. Their use is simple enough that it is deployed with a bag pulled over the Entrant's head and provides fresh air for escape. Remember, a typical person can only hold their breathe for around 1 minute. So, how far can you climb, run, crawl or simply wait? Lastly, if all Confined Spaces had a permit filled out to help identify possible hazards and had that permit posted at the point of entry. Remember, OSHA requires permits to be completed before an entry occurs. All workers involved with the entry should be aware of what the permit requires and the hazards that it may identify. I often ask employees in Confined Space work what the readings where, what time they started taking them, who signed the permit and what equipment is necessary to do the work. What do you think is the response? They have no idea what the answers are, sadly. Like sheep being led to slaughter, so is the worker being led to their death!

We have covered a lot of things here regarding Confined Spaces and safe working in those Confined Spaces. Now that you understand some things better, are Confined Spaces dangerous? Yes. Confined Spaces can be very dangerous work areas and sadly, employees are not trained to even recognize the hazards working in and around them. Employers must do their part and educate employees on the hazards of their work BUT also make every attempt to remove the hazards BEFORE exposing workers to them. Once exposed to the hazard it is too late. Confined Space work does not have to be as hazardous as we tend to make it as long as there is purposeful thought into what, how, when and why. No one wants to have an injury to an employee or worse yet, a fatality, so we all need to do a better job and implement preventive measures when working in or around Confined Spaces. So the danger is real and kills many would be rescuers each year from unknown hazards. The danger is that the hazard is not able to be seen. We look into the space and it looks fine, seems ok, nothing appears to be abnormal and then we make entry....and then we realize that something is definitely wrong. Now what? BE SAFE ALWAYS!!!



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