



## Confined Space Hazards

We define “safety” as the application of skills, technology, documents and analytics to minimize the short or long term consequences of a hazard. We have standards and regulations that provide guidance once we know what the hazard is. What eludes us most often is we don’t see the hazard. For years an American television station has peppered their broadcasting (especially children’s programming) with “the more you know” ads. These ads are to stimulate interest in further education which will enhance the listeners life. The same is true with hazards.

Hazard identification is the corner stone of any effective safety program. It is imperative that a hazard identification process be completed. Only once a hazard is found can you implement a control to eliminate or minimize it’s impact. Hazard identification helps you to understand what will hurt you. To clearly “see” a hazard, you must understand what you are looking for. There are countless optical illusions that show by focussing your vision a specific way you can clearly see a hidden object. That is what the hazard identification process is all about. Clearly seeing something that is hidden in plain sight. To refocus your vision, the hazards you look for must be clearly defined in terms that everyone can understand or recognize (eg. moving parts/equipment vs mechanical energy). Hazards can occur from what is in the space, what is happening around the space as well as what job is being performed. Some jobs will have inherent hazards and you should also consider the synergetic effect when hazards combine (eg. pressure and dust). To accomplish this requires a written list of clearly defined dangers that includes the acceptable levels of exposure to each hazard. A great list will eliminate assumptions made by the experienced journeyman and/or focus the sights of a novice which may be guided by the fear of the unknown. Definitions should include specific acceptable targets wherever practical. The definition can use words, numbers or even photos and drawings. For instance:

- ◆ biological hazards are living organisms being parasites, bacteria, viruses and/or fungi.
- ◆ temperature can have an acceptable range between 10<sup>0</sup> C and 37<sup>0</sup> C
- ◆ clutter is defined as “the accumulation of items without order”. Photos and drawings of an acceptable site shows what you mean.

Sometimes Hazard Identification process gets mixed in with Hazard evaluation stage of Risk Management. Personally, I’m not a fan of hazard evaluation/risk management in confined spaces. We need to “see” and control what we find.

The identification process facilitates the employee’s “right to know” about the hazards they face. It also brings to the forefront of any discussion - how are we going to control the issue as the work has to be done and without injury. This opens the door to the another employee right of participation. They do many instances determine control levels (or lack of controls). With an understanding of what could hurt them, maybe they would be more motivated to use the controls as they can see the consequences (injuries) that could happen if protection is not in place. Finally a good hazard identification process could minimize the exercising of the 3<sup>rd</sup> employee right of refusing unsafe work. Many work refusals are generating because the employee doesn’t understand the hazard and/or the controls in place. Knowledge can lessen that fear.

## Confined Space Hazards

Hazard	Definition
Acceleration/Sudden Movement	A sudden increase in the speed of an object greater than .25m/sec.
Biological Materials	Harmful parasites, bacteria, viruses and/or fungi.
Blocked Pathways	Human pathways are restricted by tools, materials or the space design (eg. low ceilings, corners, protrusions or small doorways) to a width of less than .9 m (3') and/or a height of 2m (6'5") and/or without a flat walking surface that prevents or slows a person from leaving.
Choices	When you must decide between two or more non similar views, objectives/ priorities, tools or procedures when completing a task.
Clutter	The accumulation of non permanent items without order.
Combustible Loading	Materials that will smoulder or burn at or below temperatures of any ignition sources in the space.
Company Organization/ Lack of Planning	When our organization, for what ever reason, fails to define the job, look at the issues of the job, allocate sufficient resources to perform the job, adequately communicate job expectations or follow good accountability practices.
Corrosives	A material with a pH value below 2 or above 11.5
Electric Current	Electricity greater than 50 milliamps moving from point A to B
Energy Waves	Invisible energy waves (eg. Ionizing - alpha, beta, gamma, and x rays, as well as non ionizing - UV, infrared, microwaves, laser and radio waves) that can burn or destroy skin tissue.
Engulfment/Entrapment	When a free flowing solid or a liquid weighing more than 50 lbs/ft <sup>3</sup> surrounds an individual or if a structural form, defect or similar issue could prevent a worker from leaving the space without assistance.
Flammable/Explosive Materials	Materials that will rapidly vaporize at atmospheric pressure and most normal temperatures that a larger than normal quantity of heat and a larger than normal volume of gas (as compared to combustible materials) is released during the process.
Gravity	Nature's downward force which will move an unsupported or unrestrained object to a lower level.
Lack of Oxygen	When the oxygen of ambient air supply going into the lungs drops below 19.5%
Light Extremes	When lighting, space design or processes increase or decrease light from 5 Watts/m <sup>2</sup> (.46 watts/ft <sup>2</sup> ).
Moving Equipment/Parts	Spindles, shafts, gears, belts, arms, pulleys, or even the entire device moving intentionally or unintentionally in any direction (up/down, in/out, diagonally or rotating) that could grab, pinch, hit or trap an individual.
Noise	Sound measuring over 85 decibels.
Oxidizer	A substance during a reaction (decomposition, mixing, etc.) releases oxygen that increases the flammability of both it and other nearby substance.
Particulate Material	The accumulation of 40 µg/m <sup>3</sup> or greater of airborne materials (dust, fumes or mists) less than 2.5 microns in diameter.
People's Positions	An individual's stance that may create temporary or permanent injury (wound, fracture or strain).
Poisons/Toxins	Materials that interfere with the body's natural functioning causing illness or death.
Pressure	Directed force either above 15 psig or above 15 mm of vacuum.
Reactive Material	Materials when mixed with other substances generate large quantities of heat or pressure
Sensitizers	Chemical or biological agents that cause a surface irritation when it comes into contact with human tissue (respiratory tract, skin, etc.).
Sharps	Edges that are sharp, pointed, grounded, angled or otherwise designed and will cause damage (eg. friction, punctures, lacerations, etc.) when an item contacts it.
State of Mind	The unanticipated thinking or reaction of an individual(s) to or during an event that causes unintended consequences.
Structural Failure	When an item fails because of the application of either short term or long term stresses.
Synergy	The combination of a number of hazards to produce a hazard greater than the mathematic sum (eg. 1+1=3)
Temperature Extremes	When the temperature of a space is below 15° C above 37° C.
Vehicle Traffic	Machines that move in a primarily horizontal direction and have operator direction.