

Protect Yourself from H²S!

In my travels around the country teaching classes about H²S, I am still amazed at the number of injuries and deaths that occur every year from this deadly gas. The stories, I hear, are real life experiences told to me by operators, wastewater workers, utility personnel and rescue crews. They are always gruesome and almost always preventable.

The number of people affected by H²S exposure and requiring medical assistance averages around 1000 per year and the deaths occurring from H²S are numbered at between 1 and 25 each year. If reports are correct in the last 90 days of 2011 there were at least 6 deaths related to H²S exposure.

Where can you find H²S? It can be anywhere in your operation. Although once believed to be primarily in forced mains, we are now seeing it everywhere. In a recent conversation I was asked if H²S can be in storm sewers. The answer is a definite. Yes!

In a conversation with an equipment supplier to the water and wastewater industry, he relayed to me that when he opened an electrical box in a system's office his H²S detector activated telling him the H²S inside the box was above 10 PPM.

So, when we say H²S can be anywhere, we really mean anywhere. H²S is a byproduct of anaerobic bacterial degradation of organic material.

Now the question arises, how do you protect yourself from injury or possible death from this deadly gas? How do you as a supervisor protect your employees and co-workers?

I recommend that every worker that might be entering a confined space of any kind have an H²S monitor on them at all times. You should never open any manhole cover without testing the atmosphere first. The cost of a few hundred dollars is cheap insurance when it comes to injury or death. Also, workers should be required to test the atmosphere prior to opening any manhole cover or lift station lids. They should also be required to log the test results. I was recently on a site where the manhole cover was removed from gravity feed line and the H²S level four feet above the ground was reading 36 ppm.

What is the acceptable level of H²S contamination? In my opinion ZERO, but most organizations require a level below 10 ppm, before entry into an enclosed space. If you are in a space that the levels escalate over 10 ppm, then mandatory evacuation may be required. H²S attacks the nervous system and in high enough concentrations can cause nausea, dizziness, disorientation and unconsciousness. At levels around 750 ppm unconsciousness is immediate and rescuers only have a few minutes to save you. At levels around 1000 ppm death is instantaneous.

Always test the atmosphere using your personal handheld four gas monitor before working on any Sewer System Blockage or overflow (SSO). You should always check the H²S levels above and below the blockage.

Massive amounts of H²S have been detected in these situations. Anyone that is working on a line downstream from a SSO is in danger when the SSO is opened to allow flow.

Whenever workings in an enclosed space make sure you use all recommended equipment and procedures for safe entry and rescue. This includes but is not limited to harnesses, tripods and any other extraction methods approved for these situations. I always recommend you have three people on site even though you are probably only required to have two people. If you work for a small utility that only has one employee, then take the Mayor or Town Council Member as your second and third person. **I am sure I will get calls on this recommendation!**

Another very important thing to remember is that an estimated 25% of all deaths occurring from H²S exposure are those of rescuers and innocent bystanders. No matter how much you want to save your friend or co-worker you need to insure the rescue is accomplished correctly. Make sure that someone on your fire department (especially volunteer fire departments) is trained in enclosed space extraction.

You never know where H²S will be present. In the past it has been assumed that H²S is minimal or non-existent in gravity lines. I have seen levels of 300 to 400 ppm of H²S in gravity mains that never fluctuates from these high levels.

You are the first person that is in charge of your safety!

Recently a story was told to me by a rescue team of an emergency concerning H²S in a wet well and two workers. When the rescue team arrived, the scene changed from a rescue attempt to a recovery mission. One of the worker's hands was visible above the water line and the other worker was hanging in the ladder. Both were deceased.

The final word: is that even though you have never seen a problem within your system or lines in the past, there is a very likely possibility that H²S is there TODAY! Always protect yourself, always test first, always monitor continuously and do not enter if the levels are too high or leave immediately if levels escalate. **Make sure that you are properly equipped at all times.** Every worker whether water, electrical or wastewater should be equipped with a four gas monitor and be required to log their test before entry into areas that could potentially contain H²S.