

Gas Detection:

Changed Behavior Can Save Lives

What's really happening in the field when it comes to using gas detectors might surprise you.

BY JEREMY DAVALLE

It was a Friday night at a metropolitan utilities company. The sun had set and it was beginning to get dark outside. The facility's employees were working quickly to finish their last minute tasks before beginning their weekend.

The final call they received was to do some work in a sewer a few blocks from their headquarters. All of them decided to go to the job so it could be finished faster. After arriving at the job

site, they lowered the youngest technician into the well. While being lowered in, he began to breathe heavy and gasped for air, only to find that it was nearly impossible to breathe. He soon passed out. His coworker quickly followed him down into the well, feeling it was his duty to save him. Unfortunately, he also began to breathe heavy and eventually passed out.

By that time, there was only one worker remaining outside of the sewer.

He also decided to go down, thinking that by holding his breath he could save the two men. Despite his efforts, he could not hold his breath and he too passed out.

After some time passed, the workers' supervisor thought it was odd that he never got a call from his crew notifying him that the job was complete. He decided to go on site and find out if the job was finished. Upon arrival, he found the service truck with the engine still running, but did not see any of his workers. Next, he looked down into the sewer and was shocked to find all three men lying there, motionless.

After calling for help, the supervisor looked inside the truck and found the gas detector laying face down on the seat. He could not understand this. He often talked with his workers about the importance of gas detection and the need to test for gases prior to entering confined spaces.

Although this story is fictional, tragedies like this frequently happen when gas monitors either are used improperly or not used at all. Manufacturers tirelessly work to make their instruments easier to use in an effort to eliminate such tragedies. But no matter how user-friendly the instruments become, if employees do not use them properly, injury and death on the job will continue to occur.

Deciding to use a gas detector is a smart thing to do. However, there are many life-threatening mistakes that an employee can make when operating the instrument. Throughout this article, an analysis of data uploaded from 27,000 gas detectors used in more than 1,100 end-user locations will be referenced. This analysis, conducted by Raghu Arunachalam, Ph.D., director of Emerging Technologies for Industrial Scientific, will provide insight into what is really happening in the field when it comes to using gas detectors.



INDUSTRIAL SCIENTIFIC CORP.

Properly using, calibrating and testing gas detectors saves lives.

IGNORING ALARMS

An initial finding in the data analysis was that 8 percent of all instruments were turned off while in alarm. In other words, the worker using the gas monitor was in an area where the instrument had gone into alarm and shut it off, disregarding the cause of the alarm.

There are a few unwarranted reasons why a worker might do this. One reason is that the instrument frequently goes into alarm in areas where hazardous gases do not exist, resulting in decreased confidence in that instrument. Once the monitor does detect a hazardous gas, the worker does not believe it to be true and turns off the instrument. Workers also may ignore alarms due to lack of training. Many gas detector manufacturers offer training that helps workers understand why a monitor will go into alarm and why trusting alarms is so important.

Remember, gas detectors are life-saving instruments that many people in a wide range of industries rely on to alert them to an explosive or hazardous atmosphere. Employees cannot rely on their senses to distinguish what is in the atmosphere. Disregarding an alarm so that work can commence or continue is not the responsible way to operate a gas detector.

USING UNCALIBRATED GAS DETECTORS

The analysis showed that approximately 14 percent of all instruments were used without being calibrated within 30 days. Calibrating gas detectors is critical, and using instruments that have not been calibrated is a serious danger.

The sensors inside a gas monitor can be thought of as an alkaline battery. Like alkaline batteries, the sensors have a finite life to them. Some companies state that a calibration should be performed every 3 months, while others say that the instruments should be calibrated every month. Either way, components inside the sensors will deteriorate over time with gas exposure. With deterioration also comes a loss of sensitivity that can result in a false reading. By calibrating the instrument, you ensure that what is being displayed is a true reading of the amount of gas in the environment.

Now that you understand the effect

INDUSTRIAL SCIENTIFIC CORP.



It is the operator's responsibility to ensure his or her gas detector has been calibrated.

of calibration on a sensor, it is much easier to see why it is so alarming that calibration does not occur. It is an operator's responsibility to make sure that the instrument being used is calibrated. If the operator is unsure that it has been calibrated in a timely manner, he is risking his life by using it. Always ask the questions: "Was this instrument calibrated within the specifications of the manufacturer?" "Would I bet my life on it?"

FAILING TO BUMP TEST

Lastly, the analysis showed that .3 percent of all gas monitors being bump tested will fail the test. Or, out of every 1,000 instruments bump tested, three will fail. A functional "bump test" is defined as a brief exposure of the monitor to a known concentration of gases to verify sensor and alarm operation. More simply – it is a confidence booster.

The person using this instrument is relying on it to alert them to an unsafe environment. The only way to be sure the detector will respond is by bump testing it prior to using it. Some say bump testing takes too long, but in reality, a bump test should only take about 30 seconds. All the worker needs to do is introduce gas to the sensors inside of the instrument and monitor their response. He or she also should verify that all of the alarms are working.

Most gas detectors have a triple redundancy of alarms. There is the standard visual and audible alarm, but there also can be a vibrating alarm. If the worker is in a loud environment and cannot see the visual alarms, they can feel the instrument vibrating so they know when to exit.

The bump test is complete once the user has verified the sensors see the gas and the alarms are properly work-

ing. It is a part of every person's job to make sure the instrument they plan to use for the day has been bump tested. It would be much better for the instrument to fail the bump test than to fail in the field while a worker is relying on it to be a life-saving instrument.

Understanding this fact, gas detection manufacturers have made bump testing even easier, with some having a more automated process. Many companies have docking stations where the user can insert the instrument and a bump test automatically will be performed and recorded. There also are various calibration stations made for instruments, some of which will perform a bump test with a push of a button. In the end, no matter how the bump test is done, it never should be a step that is skipped in maintaining a gas detector.

CHANGING BEHAVIORS TO SAVE LIVES

As you can see, a user must understand much about gas detection before entering into potentially hazardous environments. This cannot be achieved by simply providing workers with gas monitors. Even as gas detectors become easier to use, injuries and deaths in our workplaces will continue as a result of improper use of the instruments.

Therefore, workers should understand how to properly operate and maintain their instruments at all times. The workers must use the gas detectors in a way that ensures their safety, every day. In this way, workers can go home safely each night.

EHS

Jeremy DaValle is a training specialist for Industrial Scientific Corp. He can be reached at jdavalle@indsci.com.