

Sensor speed and its importance in choosing the right gas monitor

Seconds can mean the difference between life and death in the oil and gas industry, so it is important that gas monitors' sensor speed be considered when selecting the right instrumentation to safeguard workers from harmful gases.



THE SMALLEST MARGINS

Although a disparity between five and 10 seconds may seem minimal on paper, in a real-life situation those few seconds can determine whether or not a worker walks away from a lethal gas event – especially one involving hydrogen sulfide (H_2S). H_2S – one of the most deadly gases - is commonly known as sewer gas or sour gas, among other names. It is incredibly lethal, and any inhalation of H_2S in a sufficiently high concentration can cause death. In fact, among deaths from gas inhalation in the workplace, H_2S remains the leading cause. That's why it is vital that gas monitors featuring rapid sensor speeds be used, as they commonly are the first line of defense in protecting workers from toxic gas.

LOWER LIMITS RECOMMENDED

Reinforcing the importance of this is the new American Conference of Governmental Industrial Hygienists H_2S threshold limit value recommendation that suggests lower thresholds for detection of hazardous gases. The preparedness of organizations to meet this threshold entails the use of instrumentation with a quick sensor speed.

Vividly illustrating the importance of rapid sensor speed during an H_2S event is the following scenario showcasing the difference between a sensor with a t-90 time (the time it takes for a sensor to read

90 percent of the test gas concentration) of 15 seconds versus a sensor with a t-90 time of 25-40 seconds.

Again, although the lapse in time seems inconsequential, those additional 10-25 seconds can substantially alter the outcome of a gas event. When H_2S gas is simultaneously introduced to these two monitors, neither monitor will immediately react. After a few seconds, the instrument with a t-90 time of 15 seconds will begin to register a gas amount. The device that has a t-90 time of 25-40 seconds will show no digital readout on the screen.

The numbers on the device with the t-90 time of 15 seconds will continue to climb until they read 10 parts per million. At this point, the device with the longer t-90 time will have yet to register a reading, even though it will have been exposed to the same amount of gas. The worker wearing this device will start to suffer from a decreased level of muscle activity and oxygen in the blood, and will experience this for a total of 10 seconds without the alarm sounding to warn of the dangerous H_2S level.



Dräger X-am 2500

CHANGES IN CONCENTRATIONS

As the gas concentrations increase, both monitors will continue to respond to the gas. After one minute and 35 seconds of gas exposure, the device with the 15-second t-90 time will measure 15 ppm and go into an A2 alarm. The worker wearing this monitor, having been notified of the dangerous conditions, will be able to evacuate the area. Even though the monitor with the longer t-90 time will have been exposed to the same level of gas for the same amount of time, it will take an additional 42 seconds for it to reach full A2 alarm to alert the user of the presence of 15 ppm of H₂S.

During these 42 seconds of 15-ppm exposure, the worker may experience eye irritation, headache, dizziness, nausea, throat and eye irritation, coughing, and difficulty breathing. Additionally, by the end of these 42 seconds, the actual level of exposure will have risen to nearly 20ppm. At this point, all of the previous symptoms will continue to worsen and memory loss may occur.

SUMMARY

As employers strive to keep their workers safe, it is essential that they equip their crews with the solutions that will warn them of harm before it is too late. By using a device with a lower t-90 time, employers can achieve this and provide assurance to workers that they have the safety support needed to quickly and effectively escape a harmful gas event.

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