Do's and Don'ts of Atmospheric Testing

Every air monitoring program is filled with a number of choices that ultimately affect the safety of workers as they perform their daily duties. Typically the program is far from the core competency and productive focus of a company's staff and workforce. Too often, this distraction from the organization's main theme causes the program to concentrate on doing only what is necessary to get by, rather than focus on what is involved with best practices in the industry. The following list comprises some of the most common mistakes encountered with atmospheric testing programs.

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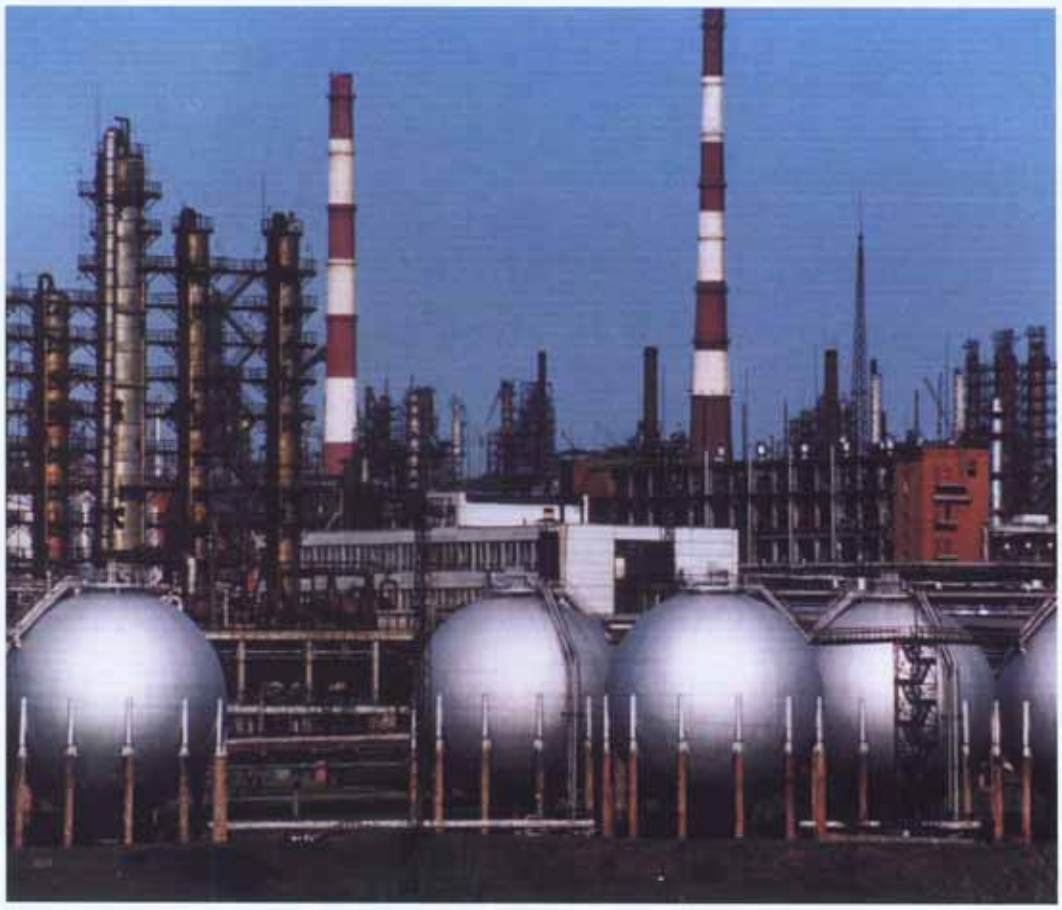
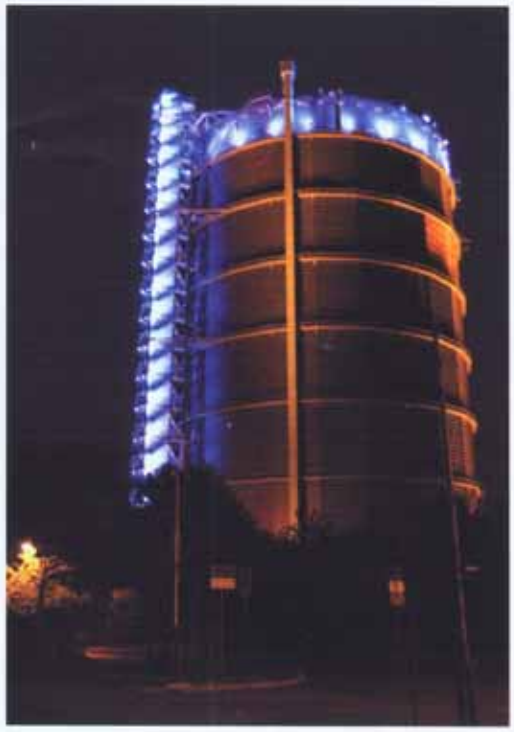
1 Wrong sensors for the job. The most fundamental mistake in an air monitoring program is the lack of proper detection equipment. Somewhere along the way, a portable confined space gas monitor became defined as a four-gas instrument which detects oxygen, combustible gas, carbon monoxide and hydrogen sulfide. While two of those components, oxygen and combustible gas sensors, are a must in almost every confined space application, the other two certainly are not. Confined spaces are different and the hazards found in them will vary. Properly assessing the potential hazards up front, and ensuring that the detection equipment is capable of effectively monitoring them is essential to the success of the program.

2 No remote sampling equipment. Local regulations governing work in confined spaces may require that the atmosphere is tested and cleared of hazards prior to a worker entering the space. This requirement would naturally lend itself to drawing a sample from within the space to the monitoring equipment. Too often however, you will walk up on a confined space entry and find someone dangling the instrument into the hole on the end of a rope. Avoiding the cost of the proper sampling equipment is impressive until the instrument is damaged in the depths of the space and the cost of the repairs exceeds the cost of the sampling equipment in the first place.



3 Bad zero references. It's natural to get to the job, take your monitor out of the truck, turn it on, look at the readings and initiate a zeroing function. This is done almost automatically without any knowledge as to whether or not the atmosphere you are standing in at the time is suitable for establishing a proper zero reference on the instrument. You must be certain that the environment you are in is free of gas contaminants before zeroing your instrument and preparing to test the atmosphere. A clear indicator that you missed this step will be that the instrument displays negative gas concentrations in an absolutely clean atmosphere. If your instrument is not capable of displaying negative readings or automatically zeros during start-up, you likely will never know that this mistake has been made.



4 Improper calibration. Any instrument will only be as accurate and reliable as its calibration. The key to a good calibration is usually as easy as verifying that the gas concentration listed on the cylinder label matches the concentration setting for calibration in the instrument. It sounds easy, but the instances of instrument users picking up a cylinder of gas at one concentration and using it to calibrate an instrument requiring a different calibration gas reference are too numerous to discuss further here.

5 Failure to test the equipment before use. This is an old story. The only way to be certain that your instrument detects gas, is to check it with gas before you use it. Performing a functional test on a gas monitor is a simple task which takes only a few seconds. Why would you trust your life to a piece of equipment that you can only assume is functioning properly? Would you be comfortable stepping aboard an airplane if you knew that the pilot did not perform the required preflight inspection? Don't skip the preflight check on your gas monitor.

6 No correlation between oxygen and combustible gas readings. Most portable gas monitoring instruments used in air monitoring programs rely on catalytic diffusion type combustible gas sensors to provide readings relative to the lower explosive limit (LEL) of the combustible gas. However, it is not usually understood that these sensors rely heavily on the presence of oxygen to provide an accurate reading. If the oxygen concentration in an environment is below 10% of volume, a potentially dangerous may go undetected because the combustible sensor will not function properly. The best practice is to always ensure a valid correlation between the oxygen and combustible gas readings on your instrument before assuming a non-hazardous atmosphere.

7 Test it then forget it. As discussed previously, local regulations may require testing the atmosphere prior to entering a confined space. When the testing is complete, the instrument goes back in the truck in too many cases. Why stop there? Atmospheric conditions in many areas can change quickly and dramatically. Because all is clear and safe now is no indication that it will be safe 15, 30 or 60 minutes from now. Keep the instrument out and continue monitoring that atmosphere as long as the work continues. In this case, it is clearly much better to be safe than sorry.

8 Lack of training. Frequently, a worker is handed an instrument, assigned the task of performing the atmospheric testing, and sent on the way without any additional training or understanding of how to operate the instrument or interpret its readings. Training tools are plentiful. Videos, computer-based training modules, online tutorials and personalized seminars are all readily available to help convey the knowledge and competency necessary for using gas monitoring instruments. Don't go out without having a clear understanding of the equipment and how to use it properly.

9 Misinterpretation of readings and data. Many people falsely believe that when they have identified that an atmospheric hazard exists but they do not know what the particular hazard is, that they can take their portable gas monitor into the area and it will specifically identify the problem. Nothing could be further from the truth. No portable gas monitor is capable of positively identifying a particular unknown target. While gas monitoring instruments use compound-specific sensors in some cases, none of these sensors will truly only respond to a single gas. Most sensors are affected by cross interferences from vapors other than the target compound. Generally there is very little understanding of the effects of cross interfering gases on sensors and therefore a great deal of misinterpretation of the data they provide.

10 Weak internal standards. Don't rely on equipment manufacturers to set your policy standards. Equipment manufacturers are experts on their equipment. They are not, nor do they claim to be in most cases, experts in your field or operations. Make certain that your policies are driven by best safety practices and not by what is most convenient or economically feasible. Simply relying on the "manufacturer's recommendation" is no way to ensure that your program is built on the foundation of observing best practices whenever possible.

These are only a few of the common mistakes made in air monitoring programs throughout industry. If you pay attention to these factors you will be well on the way to ensuring that your gas monitoring program is following the best known practices in the field. APF