Benzene and H2S Awareness Toolbox Talk

Benzene Dangers in the Workplace

Benzene is 1 of 119 agents listed as "carcinogenic to humans" by the International Agency of Research on Cancer also known as IARC. A carcinogen is defined as any substance or agent that tends to produce a cancer. It is a widely used chemical in industrial processes as well as in consumer goods. Because of its widespread use, many individuals can face exposure to this substance both on and off the job.

What is Benzene and Where is it Found?

On OSHA's Substance Data Sheet for benzene it states that: Benzene is a clear, colorless liquid with a pleasant, sweet odor. The odor of benzene does not provide adequate warning of its hazard. Mentioned above, the substance is found in many industrial processes. It is also in crude oil and a major part in gasoline. Most of the benzene in the environment comes from our use of petroleum products. In the home it is found in glues, adhesives, cleaning products, paint strippers, and tobacco smoke.

The Effects of Overexposure to Benzene (source: OSHA's Substance Data Sheet)

Short-term (acute) overexposure: If you are overexposed to high concentrations of benzene, well above the levels where its odor is first recognizable, you may feel breathless, irritable, euphoric, or giddy; you may experience irritation in eyes, nose, and respiratory tract. You may develop a headache, feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.

Long-term (chronic) exposure. Repeated or prolonged exposure to benzene, even at relatively low concentrations, may result in various blood disorders, ranging from anemia to leukemia, an irreversible, fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms.

Best Practices to Reduce Exposure to Benzene

OSHA has set the exposure limit to 1ppm for an 8 hour work day and 5ppm exposure limit for a 15 minute frame. For most people the exposure to benzene is by gasoline and its vapors, however some individuals may be exposed to it elsewhere. Some best practices to reduce your chances of being overexposed to benzene are:

- **Do not breathe in the vapors of gasoline.**
- **Fuel in a well ventilated area.**
- **Avoid areas with excessive automobile exhaust as much as possible.**
- **Avoid any water that could possibly be contaminated with benzene.**
- **Do not smoke cigarettes and do not be in areas where you could be exposed to second hand smoke.**
- **Practice good hygiene and protect your skin. Washing your hands prior to eating can reduce the chance of exposure through ingestion and limiting skin exposure can reduce absorption of benzene through the skin.**
- **At work use engineering controls to reduce or eliminate the exposure to benzene. If exposure is still over the limit, respirators must be worn that are sufficient enough to protect individuals of overexposure.**

Summary

Off the job it is much easier to reduce your exposure, however doing so at work could be more difficult if you do not understand the dangers. Talk with a supervisor or safety representative to find out the sources of benzene on the job as well as the safeguards implemented to protect against overexposure. Some of the biggest hazards at work are the ones you are not aware of.

Hydrogen Sulfide (H2S) Awareness

Michelle Gonzales

Hydrogen sulfide is a colorless, flammable, extremely hazardous gas with a “rotten egg” smell. It occurs naturally in crude petroleum and natural gas, and can be produced by the breakdown of organic matter and human/animal wastes (e.g., sewage). It is heavier than air and can collect in low-lying and enclosed, poorly ventilated areas such as basements, manholes, sewer lines and underground telephone/electrical vaults.

DETECTION BY SMELL

- Can be smelled at low levels, but with continuous low-level exposure or at higher concentrations you lose your ability to smell the gas even though it is still present.
- At high concentrations your ability to smell the gas can be lost instantly.
- DO NOT depend on your sense of smell for indicating the continuing presence of this gas or for warning of hazardous concentrations.

HEALTH EFFECTS

Health effects vary with how long, and at what level, you are exposed. Asthmatics may be at greater risk.

- Low concentrations – irritation of eyes, nose, throat, or respiratory system; effects can be delayed.
- Moderate concentrations – more severe eye and respiratory effects, headache, dizziness, nausea, coughing, vomiting and difficulty breathing.
- High concentrations – shock, convulsions, unable to breathe, coma, death; effects can be extremely rapid (within a few breaths).

BEFORE ENTERING AREAS WITH POSSIBLE HYDROGEN SULFIDE

- The air needs to be tested for the presence and concentration of hydrogen sulfide by a qualified person using test equipment. This individual also determines if fire/explosion precautions are necessary.
- If gas is present, the space should be ventilated.
- If the gas cannot be removed, use appropriate respiratory protection and any other necessary personal protective equipment (PPE), rescue and communication equipment. Atmospheres containing high concentrations (greater than 100 ppm) are considered immediately dangerous to life and health (IDLH) and a self-contained breathing apparatus (SCBA) is required.