The *BSO Plus Safety Topic* is a review designed from the BSO Plus agenda. This safety topic is your way to stay current on the safety information over the 3 years between BSO Plus and BSR.

HYDROGEN SULPHIDE (H_2S)

What is it?

Hydrogen sulphide is a highly toxic and flammable gas. H_2S occurs naturally in crude petroleum, natural gas, and hot springs. It can also be produced through the bacterial breakdown of organic materials such as human and animal waste (e.g. sewage).

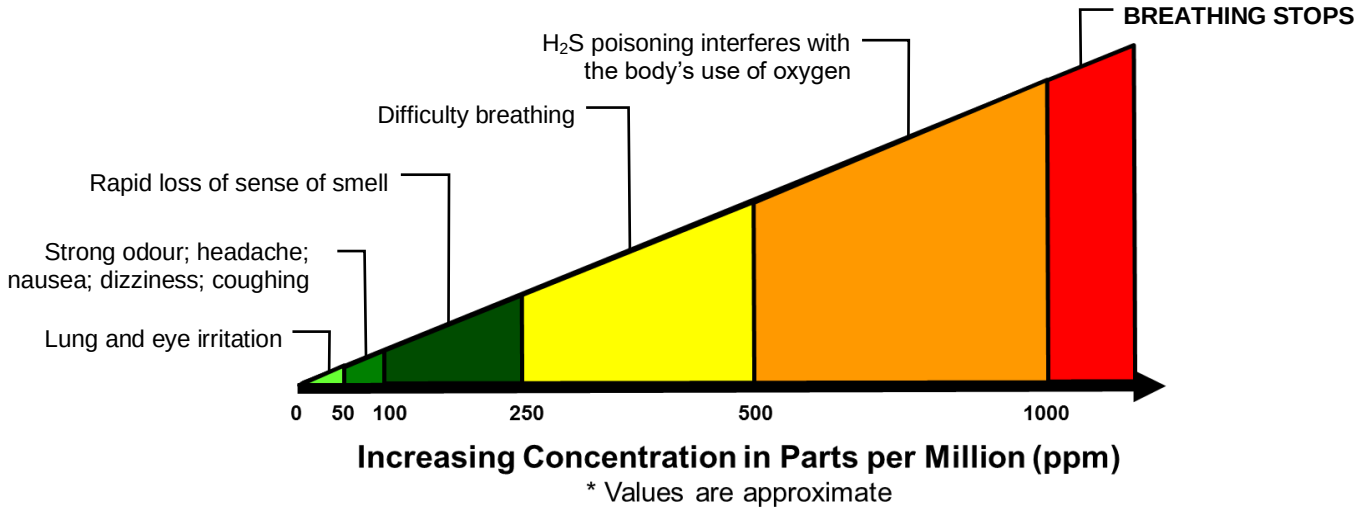
Properties of H_2S:

- Colourless gas
- Highly flammable, even explosive in some gas/air mixtures
- "Rotten egg" smell at very low concentrations
- Heavier than air – collects in low-lying areas like trenches, ditches, and sewers
- EXTREMELY TOXIC

What are the potential health risks?

Exposure to high concentrations of H_2S can kill you in only *seconds*. This gas is both an irritant and a chemical asphyxiant that affects the central nervous system and your ability to breathe.

When breathing in H_2S, you may encounter the following symptoms:



H_2S Incident

An oil worker operating a valve collapsed when exposed to H_2S. The foreman tried to rescue him and was overcome, as was a third rescue worker. Neither of the would-be rescuers had gas monitors or wore respiratory protection. Remaining crew members wearing self-contained breathing apparatus finally removed the injured workers from the area. The third worker was revived, but the first worker and the foreman died. *(Source: WorksafeBC, Hydrogen Sulphide in Industry, www.worksafebc.com)*

Where is H_2S found?

H_2S is often found in oil and natural gas deposits, and in some mineral rock. It may also form when organic material such as manure or vegetable matter breaks down without oxygen. This may happen, for example, with sewage in a septic tank. H_2S is often a by-product in the making of pulp and paper, fertilizers, glues, dyes, plastic wrap, and other products. When process streams which contain H_2S are opened to the atmosphere, H_2S may be released.

Workers are likely to find H_2S in:		Non-petroleum industries where H_2S is found:	
• Bottoms of vessels • Ditches or trenches • Tank levees	• Dike walls • Drains and sewers • Containment areas	• Pulp mills and mines • Ship holds • Smelters	• Breweries • Landfills • Swamps

Identification and control measures:

There are a variety of warning systems in place to help protect you from exposure to H_2S.

1. **Signs**: Pay attention to site-specific signs advising of the presence or possible presence of H_2S.
2. **Personal Monitors**: Monitors won't protect you from inhaling H_2S, but they will provide a warning if a toxic vapour is present so that you can escape to the nearest safe area.
3. **Audible alarms**: Find out what the alarm is at your workplace that warns of a toxic vapour release.
4. **Windsocks**: These give you a visual direction of the wind so that in the event of a toxic vapour release, you can move upwind or cross-wind to reach the nearest safe area.

It's very important to note that you must <u>never rely on your sense of smell</u> to warn you of the presence of H_2S. Concentrations as low as 150 ppm can overwhelm and deaden your sense of smell; the gas will be there, but you won't know it.

If your work partner goes down in an identified H_2S area, **do not** attempt to rescue him or her. Follow site procedures, notify area personnel and the rescue team who are trained and have the proper personal protective equipment to perform the rescue.

USING H_2S MONITORS ON SITE

The Safety Partnership's Safety Training Standards Committee (STS) approved the following requirements regarding the use of H_2S monitors on local plant sites (each site will define specific requirements):

1. Breathing zone definition – all monitors must be worn on a collar or the front of the hard hat (only if attached using a proper clip).
2. All bump testing will be done using the manufacturer's recommendations. Due to the fact that different sites have different monitors, bump test frequency will vary site to site.
3. Personal monitors set to alarm at 5 ppm are acceptable at all sites.

Breathing Zone defined