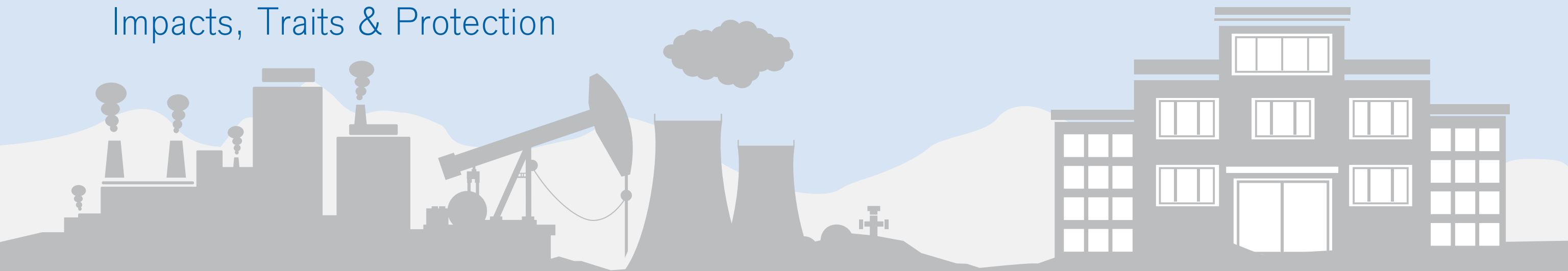


# Hydrogen Sulphide in the Oil & Gas Industry:

## Impacts, Traits & Protection



**Hydrogen Sulphide (H<sub>2</sub>S)** is a highly toxic gas that is one of the most commonly occurring substances in the oil and gas industry. From industrial processing of natural gas, to desulphurization of crude oil, to storage and transport, H<sub>2</sub>S can arise suddenly in lethal concentrations that are undetectable to the human nose. Employees can stay safe by understanding the effects of H<sub>2</sub>S at rising exposure levels and tips for proper measurement and protection.

### The Impacts of H<sub>2</sub>S Exposure on the Body

Even low doses of H<sub>2</sub>S can be harmful, damaging the lungs and the central nervous system and causing skin and mucous membrane irritation.

Typical symptoms of H<sub>2</sub>S poisoning are headache, fatigue, dizziness, dry mouth, anxiety, agitation, confusion, lack of coordination and sensory problems.

**Eye irritation** — soreness, tearing, light sensitivity

**Neurological** — dizziness, headache, nausea, shock, confusion, unconsciousness

**Disabled sense of smell**

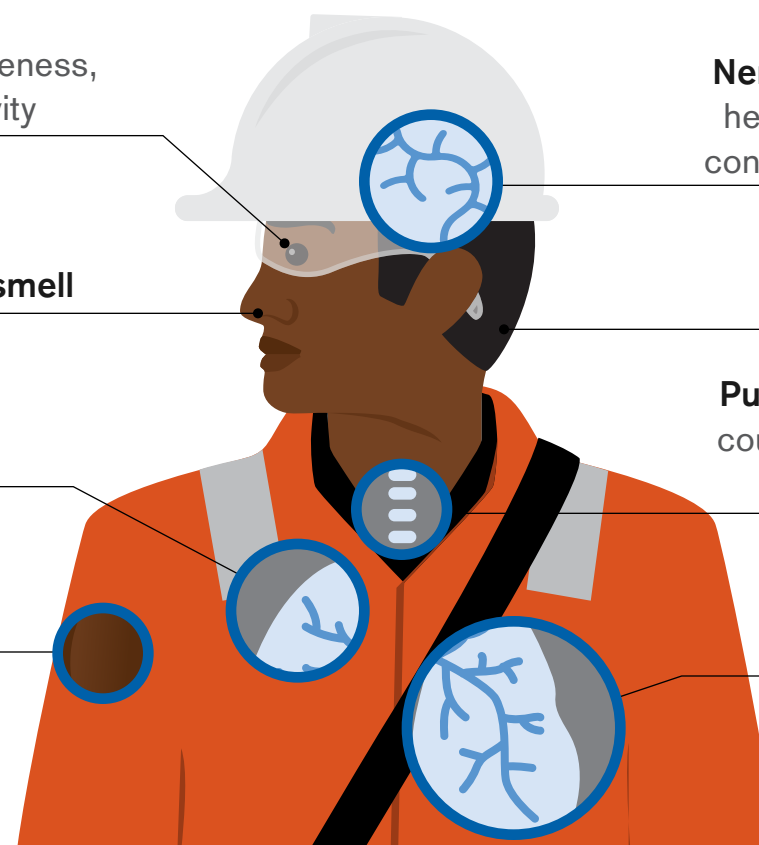
**“Knockdown”** — brief exposure to high level

**Blocks cells** from receiving oxygen

**Pulmonary** — sore throat, coughing, chest tightness, fluid in lungs, apnea

**Skin irritation**

**Death** — due to asphyxiation



### What Happens as H<sub>2</sub>S Levels Rise?

0-20 ppm	21-99 ppm	100-1,000 ppm
<p><b>0.00047</b> — Recognition threshold, 50% of people can detect the odor</p> <p><b>0.13</b> — Threshold of odor detection</p> <p><b>0.77</b> — Readily perceptible odor</p> <p><b>4.6</b> — Easily noticeable odor. Prolonged exposure may deaden the sense of smell</p> <p><b>5</b> — Metabolic changes in exercising individuals, not clinically significant</p> <p><b>10</b> — Eye irritation, soreness, redness, burning</p> <p><b>11–20</b> — Painful eye, nose and throat irritation, headaches, fatigue, irritability, insomnia, gastrointestinal disturbance, loss of appetite, dizziness. Prolonged exposure causes bronchitis and pneumonia</p>	<p><b>At these levels, Occupational Exposure Levels (OEL) in all regions have been exceeded.</b></p> <p><b>Respiratory and eye protection must be worn!</b></p> <p><b>27</b> — Strong, unpleasant, but not intolerable odor</p> <p><b>30</b> — Recognizable rotten egg odor</p> <p><b>31–99</b> — Odor becomes sickly sweet. Prolonged exposure will cause serious eye damage, migraine headaches, nausea, dizziness, coughing, vomiting and difficulty breathing</p>	<p><b>At these levels, Immediately Dangerous to Life and Health (IDLH) limits have been exceeded.</b></p> <p><b>An air-purifying respirator should no longer be worn; use a supplied air system and eye protection.</b></p> <p><b>100</b> — Immediate irritation of eyes and respiratory tract</p> <p><b>150</b> — Sense of smell paralyzed within 2-15 minutes</p> <p><b>200</b> — Headaches, dizziness, nausea</p> <p><b>500</b> — Unconsciousness leading to death within 30-60 minutes. Strong stimulation of nervous system and rapid breathing</p> <p><b>1,000</b> — Immediate loss of consciousness and respiratory paralysis leading to death</p>

### H<sub>2</sub>S Exposure Protection Tips



#### Identify Sources of Danger

Before starting work, identify typical H<sub>2</sub>S formation places—such as pipes, wells and valves—particularly when working in confined spaces.



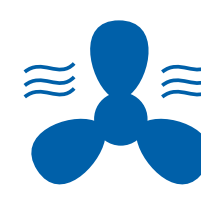
#### Wear Personal Protective Equipment

Never enter nor attempt rescue in a work area where H<sub>2</sub>S may occur without first donning the proper personal protective equipment, including respiratory protection, safety glasses and protective clothing.



#### Measure for Safe Levels

Always take a H<sub>2</sub>S reading before starting work, and be sure workers carry mobile gas detectors, especially in confined spaces, such as holes, pits and shafts.



#### Ensure Ventilation is Available

Make sure the work area is sufficiently ventilated.



#### Become Familiar with Safety Information

Learn—and if possible, memorize—the escape and rescue plan of the plant. Become familiar with local safety regulations and required protective equipment.