Hydrogen Sulfide/Respiratory Protection
Course Outline

Prerequisites: This course shall have no formal pre-requisite.

Course Length: 4 hours - Course length shall vary depending on the number of delegates. Total course time includes breaks.

Class Size: The maximum number of delegates that may be trained and tested per instructor shall be thirty-five (35) in the classroom session.

Course Objective
- Provide delegates with the sources, hazards and effects of Hydrogen Sulfide.
- Provide delegates with warning, monitoring and detection systems for H2S.
- Address Emergency Response Planning and H2S.
- Provide delegates with the information needed to successfully wear respirators.
- Provide delegates knowledge about the requirements of a respiratory protection program.
- Address different types of respirators and their use.
- Address inspection, maintenance, and storage requirements.
- Delegates should be able to demonstrate knowledge during written examination.

Course Design
- Power Point© / Lecture / Audio Video / Visual Aids
- Demonstrations

Successful Course Completion
- Requires a minimum score of 75% or better.
- Grades shall be calculated by dividing the number of questions answered correctly by the total number of exam questions.
- Delegates will have no more than thirty (30) minutes to complete the exam.
- Successful completion of all practical sessions is mandatory

Course Content Summary
- Classroom
- Practical

Breaks: 10 minutes (approximately every hour)

Lunch: 1 Hour (if applicable)
Course Outline

About Hydrogen Sulfide (H2S)
- Regulations
- Key Terms
  - Auto Ignition
  - Flammable Limits
  - Permissible Exposure Limit (PEL)
  - Threshold Limit Value (TLV)
  - Short Term Exposure Limit (STEL)
  - Ceiling
  - Immediate Dangerous to Life and Health (IDLH)
  - National Institute of Occupational Safety and Health (NIOSH)
  - Parts Per Million (PPM)
- What is H2S?
- H2S vs. Other Notable Deadly Gases
- H2S Common Names
- Characteristics
- Disposal method
- H2S Limitations
- Where is H2S found?
- H2S Accumulation
- H2S Reactivity

Effects of Hydrogen Sulfide (H2S)
- Respiratory System Effects
- Respiratory System
  - Diaphragm
  - Trachea
  - Bronchi
  - Alveoli

Hydrogen Sulfide (H2S) Exposure Limits
- H2S Signs and Symptoms of Exposure
  - 0-50 PPM
  - 100-300 PPM
    - Olfactory Nerve Paralysis
  - 300-600 PPM
  - 600-1000 PPM
- Phrenic Nerve Function
- Variables Effecting Symptoms

Hydrogen Sulfide (H2S) Detection
- Methods of Detection (advantages/disadvantages)
  - Colorimetric Tubes
  - Personal Electronic Detectors
  - Fixed Detectors

Respiratory Protection
- Common Effects from Respirator Use
- Why Wear a Respirator?
- Breathing Air Composition
- Employee Control Measures
  - Engineering Controls
  - Administrative Controls
  - Personal Protective Equipment
- Employer Responsibilities
- Respiratory Protection Program Requirements
- Employee Responsibilities
- Types of Respirators
  - Air Purifying
  - Supplied Air
    - Self-Contained Breathing Apparatus (SCBA)
    - Atmospheric Supplied Air
    - Cascade Systems
    - Escape Packs
- Fit Testing
  - Quantitative
  - Qualitative
  - Medical Requirements
- Respirator Usage
- Respirator Inspection
- Respirator Maintenance
- Proper Donning/Doffing
- Respirator Storage

Hydrogen Sulfide (H2S) Safety
- Arriving at a H2S Location
- Wind Direction Example
- Affected Employee Requirements
- When H2S is Present
• Site Location Condition Flags
  o Green – Possible Danger
  o Yellow – Moderate Danger
  o Red – Extreme Danger
• Other Deadly Gases Associated with H2S
  o Carbon Dioxide (CO2)
  o Sulfur Dioxide (SO2)
• Regular Drills
• Rescue

**Practical Session**
Practical shall verify that the delegate has acquired the following skills:
• Demonstrate satisfactory operation of personal detection equipment
• Demonstrate proper wearing of detector.
• Explain how to respond to an alarm.
• Select the proper respiratory protection equipment.
• Perform inspection of respiratory protection equipment.
• Explain the process for conducting a user seal check.
• Properly store equipment and PPE.

Additionally, employers commonly include a Respirator Fit test or Pulmonary Function test as a preparatory step prior to deployment of a worker.

**Training Center Provided Material**
• Course Materials

**Delegate Requirements**
• None

**Reference Material / Documents**
BSEE 30 CFR 250.490
OSHA 29 CFR 1910.134
ANSI/ASSE Z390.1—2017 Standard