H2S Safety Program
H2S (Hydrogen Sulfide)

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I. PURPOSE
   1. The purpose of this policy is to ensure:
      a. that workers can identify the hazards and risks of H2S;
      b. implement control measures;
      c. follow safe working procedures;
      d. to ensure the risk of worker exposure to H2S is eliminated or controlled to a safe level.
   2. Workers may potentially be exposed to H₂S when working on gas and oil transmission line Right Of Way’s (ROW’s).

II. REQUIREMENTS
   1. Comply with the applicable government regulations (federal, state, municipal).
   2. Comply with the applicable industry standards.
   3. A person not protected with supplied breathing air must not be exposed to more than 10 ppm of H2S at any time.

III. PROPERTIES OF H2S
   1. H2S is a naturally occurring gas found in numerous industries and largely in the petroleum industry.
   2. Physical state is a poisonous gas with no visible color.
   3. Smells like rotten eggs at low concentrations starting from less than 1ppm; at higher concentrations (100-150ppm) your sense of smell is impaired.
   4. Soluble in water and liquids.
   5. Flammable with an explosive range between 4 – 44%; burns with a blue flame and gives off Sulfur Dioxide (SO2).
   6. Heavier than air (1.19 vapor density), will be found in low lying areas.

IV. RESPONSIBILITIES
   1. Company
      a. Shall ensure that this policy is in compliance with applicable government regulations and legislation, and industry standards.
      b. Shall ensure that the necessary resources, training and material required to execute this policy are made available.
      c. Shall ensure that the necessary respiratory protection is available for workers.
      d. Shall ensure that the necessary H2S gas detection and personal H2S monitoring equipment are made available.
      e. Shall ensure a worker completes H2S training before working in an environment that contains or may contain H2S.
      f. Shall ensure that employees comply with this policy.
      g. Shall review a submitted contractor/subcontractor H2S program for approval.
      h. Shall review this policy at least annually and revise as required.
      i. Shall designate Senior Management to be responsible for the administration of this policy.
      j. Shall participate in implementing this policy with the participation of all employees.
      k. Shall observe the effectiveness of this policy and report any deficiencies to Senior Management.
      l. Shall participate with the review and creation of applicable written safe work procedures/practices. 13. Shall ensure that this policy remains posted in the workplace.
m. Shall post H2S warning/danger signs in the work area that contains or may contain H2S.

n. Shall only permit a worker that has completed H2S training to enter a workplace where the worker may be exposed to H2S.

o. Shall execute disciplinary actions toward a worker that violates this policy.

2. Management Responsibilities
   a. Shall comply with this policy.
   b. Shall participate in implementing this policy with the participation of Senior Management, Middle Management, the Occupational Safety Health Environment & Wellness Committee and Supervision.
   c. Shall observe the effectiveness of this policy and report any deficiencies to Senior Management.
   d. Shall ensure that all employees on site are familiar with the site specific emergency plan.
   e. Shall participate with the review and creation of applicable written safe work procedures/practices.

3. Employee Responsibilities
   a. Shall comply with this policy.
   b. Shall complete H2S training as required.

4. Contractor/Subcontractor Responsibilities
   5. Shall comply with this policy.
   6. Shall submit a H2S program to Senior Management for review and approval.

V. TRAINING
   1. Training must be provided to each worker that will be working in an environment that contains or may contain H2S.
   2. Approved H2S training must be conducted by a qualified instructor.
   3. Company training includes:
      a. Review and understanding of this policy.
      b. Identifying work areas that contain or may contain H2S.
      c. The hazards and risks of working in an H2S environment.
      d. Establishing and implementing control measures.
      e. Correct use, inspection and maintenance of supplied breathing air equipment.
      f. Correct use, inspection and maintenance of gas detection equipment.
      g. Correct use, inspection and maintenance of a personal H2S gas monitor.
      h. Competent with the emergency and rescue procedures.

VI. PLANNING
   1. Complete a hazard and risk assessment.
   2. Establish and implement safe procedures for conducting gas detection.
   3. Identify if the work area is known to have a presence of H2S.
   4. Identify if the work processes will create a presence of H2S.
   5. Ensure that each worker that may be exposed to H2S has completed approved H2S training.
   6. Ensure the necessary H2S gas detector and H2S personal monitor equipment is made available; the alarm must be set to 10ppm.
   7. Ensure that training is provided for the person that will be operating a gas detector or personal H2S monitor. 8. Ensure the person conducting gas detection is protected with supplied breathing air if there is a possibility the person may be exposed to H2S or if the person is entering an area with unknown substances or contamination.
8. Ensure the necessary PPE including supplied breathing air is made available.
10. Install a wind sock so workers can easily identify the wind direction.
11. Conduct a pre-shift meeting with all of the applicable workers to communicate the hazards, risks and control measures for working in an area with H2S.
12. Establish area specific emergency procedures to safely shut down equipment in the event of an unexpected or uncontrolled release of H2S.
13. Establish area specific emergency evacuation procedures for the event of an unexpected or uncontrolled release of H2S.
14. Establish area specific procedures for tasks involving the controlled release of H2S.

VII. INSPECTION
1. Inspect the work area for hazards (poor visibility, poor housekeeping, traffic, other workers, ground conditions, electrical hazards, etc.)
2. Inspect the supplied breathing air equipment and air lines.
3. Inspect the PPE: coveralls, safety glasses, gloves, boots, etc.
4. Inspect the fire extinguisher: fully charged, correct type, correct size.
5. Inspect the H2S gas detection equipment and perform a bump test at the start of the shift.
6. Perform a gas detection test in the area that is known to have or may have a presence of H2S, record the results; this inspection must be conducted before workers are allowed to enter the area.

VIII. CONTROL MEASURES
1. Complete a hazard and risk assessment to establish control measures specific for the work area and work tasks.
2. The following is a list of general control measures:
   a. Inform all workers of the areas that have or may have a presence of H2S; and the concentration of H2S.
   b. Post warning/danger signs.
   c. Set the personal H2S monitor and the H2S gas detector to alarm at 10ppm. i. If the H2S Monitor alarm sounds, all personnel in the area shall immediately evacuate or don a SCBA unit.
   d. Always perform a gas test of the work area suspected of containing H2S before starting work and at specified intervals during the work shift.
   e. Wear supplied breathing air when entering an atmosphere that contains more than 10ppm of H2S or if a. the H2S concentration is unknown.
   f. Designate a safety watch where necessary for tasks involving the controlled release of H2S.
   g. Immediately vacate the work area when the personal H2S monitor alarms.

IX. EMERGENCY PLANNING
1. An emergency response plan must be written for work that involves the risk of H2S exposure.
2. Emergency response plan shall include:
   a. Work area: exact location, structure/layout of the building or structure the work area is in.
   b. hazards that may impede rescue, location of emergency SCBA (self-contained breathing air) packs,
   c. location of communication equipment.
d. Rescue team: names, location of rescue team, communication method, response time for rescue team.
e. Procedures for safely shutting down equipment.
f. Procedures for extricating a worker.
g. Procedures for transporting an injured worker to a hospital or medical center.

X. FIRST AID
1. A qualified first aid attendant must be designated for a workplace that contains a presence of H2S.
2. First aid including CPR must be provided by a qualified first aid attendant.
3. A person exposed to more than 10ppm of H2S that is not protected by supplied breathing air must be removed to fresh air immediately.
4. A person knocked down from H2S exposure must be examined by a medical doctor immediately for the risk of pulmonary edema and other illnesses/injuries.

XI. H2S EXPOSURE and POSSIBLE HEALTH EFFECTS
1. Less than 1ppm
   a. Smells like rotten eggs
   b. 10ppm
   c. No known adverse health effects for most people.
   d. Respiratory protection is required beyond this level.
2. 20-200ppm
   a. Eye and respiratory tract irritation and loss of smell.
   b. Headache and nausea.
   c. 100ppm is considered immediately dangerous to life and health.
3. 200-500ppm
   a. Above effects, but sooner and more severe.
   b. Loss of breathing and death within hours.
4. 500-700ppm
   a. Affects the central nervous system.
   b. Loss of reasoning, loss of balance, unconsciousness and breathing stops within minutes.
5. 700ppm and above
   a. Immediate loss of consciousness.
   b. Permanent brain damage and death if not rescued immediately.
Controlled Document

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Originator: S.C. Brockman

Safety Committee Review
Date: ____________________

Chairman: ________________________________

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