

“H2S CONTINGENCY PLAN”

AMERADA HESS MONUMENT AREA

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“H2S CONTINGENCY PLAN”

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I. H₂S CONTINGENCY PLAN SECTION

Scope

This contingency plan establishes guidelines for all company employees and contract employees whose work activities may involve exposure to Hydrogen Sulfide gas (H₂S).

Objective

1. Prevent any and all accidents, and prevent the uncontrolled release of H₂S into the atmosphere.
2. Provide proper evacuation procedures to cope with emergencies.
3. Provide immediate and adequate medical attention should an injury occur.

Discussion of Plan

Suspected Problem Zones: YATES, SEVEN RIVERS, QUEEN, AND GRAYBURG

Implementation: This plan, with all details, is to be fully implemented before drilling starts.

Emergency Response Procedure: This section outlines the conditions and denotes steps to be taken in the event of an emergency.

Emergency Equipment and Procedure: This section outlines the safety and emergency equipment that will be required for the drilling of this well.

Training Provisions: This section outlines the training provisions that must be adhered to prior to drilling.

Emergency Call Lists: Included are the telephone numbers of all persons that would need to be contacted should an emergency exists.

Briefing: This section deals with the briefing of all people involved in the drilling operation.

Public Safety: Public Safety Personnel will be made aware of the drilling of this well.

Checklists: Status Checklists and Procedural Checklists have been included to insure adherence to the plan.

II. EMERGENCY PROCEDURES SECTION

Emergency Procedures

- I. In the event of any evidence of H₂S level above 10 ppm, take the following steps immediately:
 - A. Secure breathing apparatus.
 - B. Order non-essential personnel out of the danger zone.
 - C. Take steps to determine if the H₂S level can be corrected or suppressed, and if so, proceed with normal operations.
- II. If uncontrollable conditions occur, proceed with the following:
 - A. Take steps to protect and/or remove any public downwind of the rig including partial evacuation or isolation. Notify necessary public safety personnel and regulatory agencies.
 - B. Remove all personnel to the Safe Briefing Area.
 - C. Notify public safety personnel for help with maintaining roadblocks and implementing evacuation.
 - D. Determine and proceed with the best possible plan to regain control of the well. Maintain tight security and safety procedures.
- III. Responsibility
 - A. The Company Approved Supervisor shall be responsible for the total implementation of the plan.
 - B. The Company Approved Supervisor shall be in complete command during any emergency.
 - C. The Company Approved Supervisor shall designate a back up Supervisor in the event that he/she is not available.

Emergency Procedure Implementation

- I. Drilling or Tripping
 - A. All Personnel
 - 1. When alarm sounds, don escape unit and report to upwind Safe Briefing Area.
 - 2. Check status of other personnel (buddy system).
 - 3. Secure breathing apparatus.
 - 4. Await orders from Supervisor.
 - B. Drilling Foreman
 - 1. Report to the upwind Safe Briefing Area.
 - 2. Don Breathing Apparatus and return to the point of release with the Tool Pusher or Driller (buddy system).
 - 3. Determine the concentration of H₂S.
 - 4. Assess the situation and take appropriate control measures.

- C. Tool Pusher
 - 1. Report to the upwind Safe Briefing Area.
 - 2. Don Breathing Apparatus and return to the point of release with the Drilling Foreman or Driller (buddy system).
 - 3. Determine the concentration of H₂S.
 - 4. Assess the situation and take appropriate control measures.
- D. Driller
 - 1. Don escape unit.
 - 2. Check monitor for point of release.
 - 3. Report to the Safe Briefing Area.
 - 4. Check the status of other personnel (in a rescue attempt, always use the buddy system).
 - 5. Assign the least essential person to notify the Drilling Foreman and Tool Pusher, in the event of their absence.
 - 6. Assume the responsibility of the Drilling Foreman and Tool Pusher until they arrive, in the event of their absence.
- E. Derrick Man
 - 1. Remain in the Safe Briefing Area until otherwise instructed by Supervisor.
- F. Mud Engineer
 - 1. Report to Safe Briefing Area.
- II. Taking A Kick
 - A. All personnel report to Safe Briefing Area.
 - B. Follow standard BOP procedures.
- III. Open Hole Logging
 - A. All unnecessary personnel should leave the rig floor.
 - B. Drilling Foreman and Safety personnel should monitor the conditions and make necessary safety equipment recommendations.
- IV. Running Casing or Plugging
 - A. Follow “Drilling or Tripping” procedures.
 - B. Assure that all personnel have access to protective equipment.

Simulated Blowout Control Drills

All drills will be initiated by activating alarm This operation will be performed by the Drilling Foreman or Tool Pusher at least one time per week.

Drill Date.: _____

Reaction Time to Shut-In: _____ minutes, _____ seconds.

Total Time to Complete Assignment: _____ minutes, _____ seconds.

I. Drill Overviews

A. Drill No. 1--Bottom Drilling

1. Sound the alarm immediately.
2. Stop the rotary and hoist kelly joint above the rotary table.
3. Stop the circulatory pump.
4. Close drill pipe rams.
5. Record casing and drill pipe shut-in pressures and pit volume increases.

B. Drill No. 2--Tripping Drill Pipe

1. Sound the alarm immediately.
2. Position the upper tool joint just above the rotary table and set slips.
3. Install a full opening valve or inside blowout preventor tool in order to close the drill pipe.
4. Close the drill pipe rams.
5. Record the shut-in annular pressure.

III. IGNITION PROCEDURES SECTION

Responsibility

The decision to ignite the well is the responsibility of the DRILLING FOREMAN in concurrence with the STATE POLICE. In the event the Drilling Foreman is incapacitated, it becomes the responsibility of the RIG TOOL PUSHER. This decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.
2. There is no hope of controlling the blowout under the prevailing conditions.

If time permits, notify the main office, but do not delay if human life is in danger. Initiate the first phase of the evacuation plan.

Instructions for Igniting the Well

1. Two people are required for the actual igniting operation. Both men must wear self-contained breathing apparatus and attach a safety rope. One man must monitor the atmosphere for explosive gases with the Explosimeter, while the Drilling Foreman is responsible for igniting the well.
2. The primary method to ignite is a 25mm flare gun with a range of approximately 500 feet.
3. Ignite from upwind and do not approach any closer than is warranted.
4. Select the ignition site best suited for protection and which offers an easy escape route.
5. Before igniting, check for the presence of combustible gases.
6. After igniting, continue emergency actions and procedures as before.
7. All unassigned personnel will limit their actions to those directed by the Drilling Foreman.

NOTE: After the well is ignited, burning Hydrogen Sulfide will convert to Sulfur Dioxide, which is also highly toxic. Do not assume the area is safe after the well is ignited.

IV. TRAINING PROGRAM SECTION

Training Requirements

When working in an area where Hydrogen Sulfide gas (H₂S) might be encountered, definite training requirements must be carried out. The Company Supervisor will insure that all personnel, at the well site, have had adequate training in the following:

1. Hazards and characteristics of H₂S.
2. Physical effects of Hydrogen Sulfide on the human body.
3. Toxicity of Hydrogen Sulfide and Sulfur Dioxide.
4. H₂S detection.
5. Emergency rescue.
6. First aid and artificial resuscitation. (At least 2 employees)
7. The effects of H₂S on metals.
8. Location safety.

Service company personnel and visiting personnel must be notified if the zone contains H₂S, and each service company must provide adequate training and equipment for their employees before they arrive at the well site.

V. EMERGENCY EQUIPMENT SECTION

Emergency Equipment Requirements

- I. Signs
 - A. Located at the location entrance with the following information:
(Lease)
CAUTION-POTENTIAL POISON GAS
HYDROGEN SULFIDE
NO ADMITTANCE WITHOUT AUTHORIZATION
- II. A. Air line units for all rig personnel on location.
B. Cascade system with hose lines .
- III. Wind socks or wind streamers
 - A. Two 10” windsocks located at strategic locations at a height visible from the rig floor.
 - B. Wind streamers (if preferred) to be placed at various locations on the well site to ensure wind consciousness at all times. (Corners of location).
- IV. Hydrogen Sulfide detector and alarms.
 - A. 1-Portable H₂S monitor.
 - B. 4 sensors located at floor, bell nipple, and shale shaker & pit.
 - C. Hand operated detectors with tubes.
 - D. H₂S monitor tester.
- V. Condition sign and flags
 - A. One each of green, yellow, and red condition flags to be displayed to denote conditions:
GREEN--Normal Conditions
YELLOW--Potential Danger
RED--Danger, H₂S Present
 - B. The condition flag shall be posted at the location entrance.
- VI. ***Rescue Equipment**
 - A. Stretcher
 - B. First Aid Supply
- VII. Fire extinguishers
 - A. Adequate fire extinguishers shall be located at strategic locations.

- VIII. Blowout prevention equipment
 - A. The well shall have hydraulic BOP equipment.
 - B. Equipment must be tested upon installation.
- IX. ***Combustible gas detectors**
 - A. There shall be one combustible gas detector on location at all times.
- X. BOP testing
 - A. BOP, Choke Line and Kill Line will be tested as specified by operator.
- XI. Audio system
 - A. Communication shall be available at the rig.
 - B. Communication shall be available at the rig floor or trailer.
 - C. Communication shall be available on vehicles.
- XII. Special control equipment
 - A. Hydraulic BOP equipment with remote control on ground.
 - B. Rotating head at surface casing point.
- XIII. Evacuation Plan
 - A. Evacuation routes should be established prior to spudding each well.
 - B. Should be discussed with all rig personnel.
- XIV. Designated Areas
 - A. Parking and visitor area.
 - 1. All vehicles are to be parked at a pre-determined safe distance from the wellhead.
 - 2. Designated smoking area.
 - B. Safe Briefing Area
 - 1. Two Safe Briefing Areas shall be designated on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds or they are at a 180 degree angle if wind directions tend to shift in the area.
 - 2. Personal protective equipment should be stored in both protection centers or if a moveable trailer is used, it should be kept upwind of existing winds. When wind is from the prevailing direction, both protection centers should be accessible.

*** - Additional Emergency Equipment is on Stand-By at Indian Fire & Safety in Hobbs N.M.**

VI. CHECK LIST SECTION

Status Check List

Note: When equipment is implemented date each item.

1. Sign at location entrance. _____
2. Two (2) wind socks (in required locations). _____
3. Wind streamers (if required). _____
4. 30 minute pressure demand air packs on location
for all rig personnel and mud loggers. _____
5. Air packs, inspected and ready for use. _____
6. Spare bottles for each air pack (if required). _____
7. Cascade system and hose line hook up. _____
8. Cascade system for refilling air bottles. _____
9. Choke manifold hooked-up and tested.
(Before drilling out surface casing.) _____
10. Remote Hydraulic BOP control (hooked-up and
tested before drilling out surface casing.) _____
11. BOP Preventor tested (before drilling out
surface casing.) _____
12. Mud engineer on location with equipment to test
mud for Hydrogen Sulfide. _____
13. Safe Briefing Areas set-up. _____
14. Condition sign and flags on location and ready. _____
15. Hydrogen Sulfide detection system hooked-up. _____
16. Hydrogen Sulfide alarm system hooked-up. _____

17. Oxygen resuscitator on location and tested for use. _____
18. Stretcher on location at Safe Briefing Area. _____
19. 1-20 # or 30# ABC fire extinguisher in safety trailer in addition to those on rig. _____
20. Combustible gas detector on location and tested. _____
21. All rig crews and supervisors trained (as required). _____
22. Access restricted for unauthorized personnel. _____
23. Drills on H₂S and well control procedures. _____
24. All outside service contractors advised of potential Hydrogen Sulfide on the well. _____
25. NO SMOKING sign posted. _____
26. Hand operated H₂S detector with tubes on location. _____
27. 25mm flare gun with flares. _____

Procedural Check List

Perform the following on each tour:

1. Check fire extinguishers to see that they have the proper charge.
2. Check breathing equipment to insure that it has not been tampered with.
3. Check pressure on supply air bottles to see that they are capable of recharging.
4. Make sure all of the Hydrogen Sulfide detection systems are operative.

Perform the following each week:

1. Check each piece of breathing equipment to make sure that the demand regulator is working. This requires that the bottle be opened and the mask assembly be put on tight enough so that when you inhale, you get air.
2. Blowout preventor skills.
3. Check supply pressure on BOP accumulator stand-by source.
4. Check all work/escape units for operation: demand regulator, escape bottle air volumes, supply bottle of air volume.
5. Check breathing equipment mask assembly to see that straps are loosened and turned back, ready to put on.
6. Check pressure on breathing equipment air bottles to make sure they are charged to full volume.
7. Check breathing equipment air bottles to make sure all demand regulators are working. This requires that the bottles be opened and the mask assembly be put on tight enough so that when you inhale, you get air.
8. Confirm pressure on all supply air bottles.
9. Perform breathing equipment drills with on-site personnel.
10. Check oxygen resuscitator for pressure on oxygen bottle and make sure demand regulator is working.
11. Check the following supplies for availability:
 - a. Stretcher
 - b. Safety belts and ropes
 - c. Emergency telephone lists
 - d. Spare air bottles
 - e. Hand operated H₂S detectors and tubes
12. Test the Explosimeter to verify batteries are good.

VII. BRIEFING PROCEDURES SECTION

Briefing Procedures

The following scheduled briefings will be held to ensure the effective drilling and operation of this project:

Pre-Spud Meeting

Date: Prior to spudding the well.

Attendance: Drilling Foreman
Rig Pushers
Rig Driller
Mud Engineer
All Safety Personnel
Service Companies

Purpose: Review and discuss the well program, step-by-step, to insure complete understanding of assignments and responsibilities.

VIII. EVACUATION PLAN SECTION

General Plan

The direct lines of action to protect the public from hazardous gas situations are as follows:

1. When the company approved supervisor (Drilling Foreman, Tool Pusher, Driller) determine the Hydrogen Sulfide gas cannot be limited to the well location, and the public will be involved, he will activate the evacuation plan.
2. Company safety personnel or designee will notify the appropriate local government agency that a hazardous condition exists and evacuation needs to be implemented.
3. Company approved safety personnel that have been trained in the use of Hydrogen Sulfide detection equipment and self-contained breathing equipment.
4. Law enforcement personnel (State Police, Local Police Department, Fire Department, and the Sheriff's Department) will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.

NOTE: Law enforcement personnel will not be asked to come into a contaminated area. Their assistance will be limited to uncontaminated areas. Constant radio contact will be maintained with them.

5. After the discharge of gas has been controlled, "Company" safety personnel will determine when the area is safe for re-entry.

Emergency Assistance Telephone List

Government Agencies

State Police	911
Hospital	(505)492-5000
Ambulance	911
Fire Dept.	911

Oil Company

<u>AMERADA HESS DRILLING DEPT.</u>	(713)609-5000
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Bob McSpadden	Office (713)609-4843 Home (281)586-8537
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Rig Phone	(505)631-4892
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PRODUCTION DEPT.

Jay Baker	Office (505)393-0087 ext. 103 Home (432)758-2304
Randy Barnes	Office (505)393-0087 ext 104 Home (505)392-1043
Al Young	Office (505)393-0087 ext. 117 Home (505)392-1478
Lou Phillips	Office (505)393-0087 ext. 107 Home (505)396-4798
Albert Maes	Office (505)393-0087 ext. 125 Home (505)392-5000
Bill Petree	Office (505)393-0087 ext. 115 Home (505)392-3327
Robbie Ferbrache	Office (505)393-0087 ext. 120 Home (505)394-2765

HS&E DEPT.

Randy Ferguson	Office (432)758-6740 Home (505)397-6888
Sam Small	Office (432)758-6741 Home (505)392-2767

Safety Company

Table II
Physical Effects of Hydrogen Sulfide

Percent %	ppm	Physical Effects
0.001	10	Obvious and unpleasant odor.
0.002	20	Safe for 8 hrs. exposure
0.01	100	Kills smell in 3 to 5 minutes; may sting eyes and throat.
0.02	200	Kills smell shortly; stings eyes and throat.
0.03	300	IDLH (Immediately Dangerous to Life & Health)
Level.		
0.05	500	Dizziness; breathing ceases in a few minutes
0.07	700	Unconscious quickly; death will result if not rescued.
0.10	1000	Unconscious at once; followed by death within minutes.

*Caution: Hydrogen Sulfide is a colorless and transparent gas and is highly flammable. It is heavier than air and may accumulate in low places.

Use of Self-Contained Breathing Apparatus

- I. Written procedures shall be prepared covering safe use of respirators in dangerous atmospheric situations which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.
- II. Respirators shall be inspected frequently, at random, to insure that they are properly used, cleaned, and maintained.
- III. Anyone who may use respirators shall be trained in how to properly seal the face piece. They shall wear respirators in normal air and then in a test atmosphere. (Note: Such items as facial hair (beard or sideburns) and eyeglass temple pieces will not allow a proper seal.) Anyone that may be expected to wear respirators should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses. Contact lenses should not be allowed.
- IV. Maintenance and care of respirators
 - A. A program of maintenance and care of respirators shall include the following:
 1. Inspection for defects, including leak checks.
 2. Cleaning and disinfecting.
 3. Repair.
 4. Storage.
 - B. Inspection: Self-Contained Breathing Apparatus for emergency use shall be inspected monthly, and records maintained, for the following:
 1. Fully charged cylinders.
 2. Regulator and warning device operation.
 3. Condition of face piece and connection.
 4. Elastomer or rubber parts shall be stretched or massaged to keep them pliable and prevent deterioration.
 - C. Routinely used respirators shall be collected, cleaned, and disinfected as frequently as necessary to insure proper protection is provided.
- V. Persons assigned tasks that require the use of Self-Contained Breathing Equipment shall be certified physically fit for breathing equipment usage by the local company physician at least annually.
- VI. Respirators should be worn during the following conditions:
 - A. Any employee who works near the top or on the top of any tank unless tests reveal less than 20 ppm of H₂S.
 - B. When breaking out any line where H₂S can reasonably be expected.
 - C. When sampling air in areas to determine if toxic concentrations of H₂S exist.
 - D. When working in areas where over 20 ppm H₂S has been detected.
 - E. At any time where there is a doubt as to the H₂S level in the area to be entered.

Rescue-First Aid for Hydrogen Sulfide Poisoning

Do Not Panic!!!

Remain Calm--THINK

1. Hold your breath (Do not inhale; stop breathing.) and go to Briefing area.
2. Put on breathing apparatus.
3. Remove victim(s) to fresh air as quickly as possible. (Go upwind from the source or at right angles to the wind; NOT downwind.)
4. Briefly apply chest pressure--arm lift method of artificial respiration to clear the victim's lungs and to avoid inhaling any toxic gas directly from the victim's lungs
5. Provide for prompt transportation to the hospital, and continue giving artificial respiration if needed.
6. Hospital(s) or medical facilities need to be informed, beforehand, of the possibility of H₂S gas poisoning, no matter how remote the possibility.
7. Notify emergency room personnel that the victim(s) have been exposed to H₂S gas.

Besides basic first aid, everyone on location should have a good working knowledge of artificial respiration, as well as first aid for eyes and skin contact with liquid H₂S. Everyone needs to master these necessary skills.