STATEWIDE RULE 36

§3.36 Oil, Gas, or Geothermal Resource Operation in Hydrogen Sulfide Areas

(Amended Effective November 24, 2004)

(a) Applicability. Each operator who conducts operations as described in paragraph (1) of this subsection shall be subject to this section and shall provide safeguards to protect the general public from the harmful effects of hydrogen sulfide. This section applies to both intentional and accidental releases of hydrogen sulfide.

(1) Operations including drilling, working over, producing, injecting, gathering, processing, transporting, and storage of hydrocarbon fluids that are part of, or directly related to, field production, transportation, and handling of hydrocarbon fluids that contain gas in the system which has hydrogen sulfide as a constituent of the gas, to the extent as specified in subsection (c) of this section, general provisions.

(2) This section shall not apply to:

(A) operations involving processing oil, gas, or hydrocarbon fluids which are either an industrial modification or products from industrial modification, such as refining, petrochemical plants, or chemical plants;

(B) operations involving gathering, storing, and transporting stabilized liquid hydrocarbons;

(C) operations where the concentration of hydrogen sulfide in the system is less than 100 ppm.

(b) Definitions.

(1) Industrial modification--This term is used to identify those operations related to refining, petrochemical plants, and chemical plants. The term does not include field processing such as that performed by gasoline plants and their associated gathering systems.

(2) Stabilized liquid hydrocarbon--The product of a production operation in which the entrained gaseous hydrocarbons have been removed to the degree that said liquid may be stored at atmospheric conditions.

(3) Radius of exposure--That radius constructed with the point of escape as its starting point and its length calculated as provided for in subsection (c)(2) of this section.

(4) Area of exposure--The area within a circle constructed with the point of escape as its center and the radius of exposure as its radius.

(5) Public area--A dwelling, place of business, church, school, hospital, school bus stop, government building, a public road, all or any portion of a park, city, town, village, or other similar area that can expect to be populated.

(6) Public road--Any federal, state, county, or municipal street or road owned or maintained for public access or use.

(7) Sulfide stress cracking--The cracking phenomenon which is the result of corrosive action of hydrogen sulfide on susceptible metals under stress.

(8) Facility modification--Any change in the operation such as an increase in throughput, in excess of the designed capacity, or any change that would increase the radius of exposure.

(9) Public infringement--This shall mean that a public area and/or a public road, or both, has been established within an area of exposure to the degree that such

infringement would change the applicable provisions of this rule to those operations responsible for creating the area of exposure.

(10) Potentially hazardous volume of hydrogen sulfide--A volume of hydrogen sulfide gas of such concentration that:

(A) the 100 ppm radius of exposure is in excess of 50 feet and includes any part of a "public area" except a public road; or

(B) the 500 ppm radius of exposure is greater than 50 feet and includes any part of a public road; or

(C) the 100 ppm radius of exposure is greater than 3,000 feet.

(11) Contingency plan--A written document that shall provide an organized plan of
action for alerting and protecting the public within an area of exposure prior to an intentional release, or following the accidental release of a potentially hazardous volume of hydrogen sulfide.

(12) Reaction-type contingency plan--A preplanned, written procedure for alerting and protecting the public, within an area of exposure, where it is impossible or impractical to brief in advance all of the public that might possibly be within the area of exposure at the moment of an accidental release of a potentially hazardous volume of hydrogen sulfide.

(13) Definition of referenced organizations and publications.

(A) ANSI--American National Standard Institute, 1430 Broadway, New York, New York 10018, Table I, Standard 253.1-1967.

(B) API--American Petroleum Institute, 300 Corrigan Tower Building, Dallas, Texas 75201, Publication API RP-49, Publication API RP-14E, Sections 1.7(c), 2.1(c) 4.7.

(C) ASTM--American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103, Standard D-2385-66.

(D) GPA--Gas Processors Association, 1812 First Place, Tulsa, Oklahoma 74120, Plant Operation Test Manual C-1, GPA Publication 2265-68.

(E) NACE--National Association of Corrosion Engineers, P.O. Box 1499, Houston, Texas 77001, Standard MR-01-75.

(F) DOT--Department of Transportation, Office of Pipeline Safety, 400 Seventh Street, S.W., Washington, D.C. 20590, Title 49, Code of Federal Regulations, Parts 192 and 195.

(G) OSHA--Occupational Safety and Health Administration, United States Department of Labor, 200 Constitution Avenue, NW, Washington D.C. 20270, Title 29, Code of Federal Regulations, Part 1910.145(c)(4)(i).

(H) RRC--Railroad Commission of Texas, Gas Utilities Division, P.O. Drawer 12967, Capitol Station, Austin, Texas 78711, Gas Utilities Dockets 446 and 183.

(c) General provisions.

(1) Each operator shall determine the hydrogen sulfide concentration in the gaseous mixture in the operation or system.

(A) Tests shall be made in accordance with standards as set by ASTM Standard D-2385-66, or GPA Plant Operation Test
Manual C-1, GPA Publication 2265-68, or other methods approved by the commission.

(B) Test of vapor accumulation in storage tanks may be made with industry accepted colormetric tubes.

(2) For all operations subject to this section, the radius of exposure shall be determined, except in the cases of storage tanks, by the following Pasquill-Gifford equations, or by other methods that have been approved by the commission.

(A) For determining the location of the 100 ppm radius of exposure: x = [(1.589) (mole fraction H2 </sub>S)(Q)] to the power of (.6258).

(B) For determining the location of the 500 ppm radius of exposure: x = [(0.4546) (mole fraction H2 </sub>S)(Q)] to the power of
(.6258). Where x = radius of exposure in feet; Q = maximum volume determined to be available for escape in cubic feet per day; H 2 </sub>S = mole fraction of hydrogen sulfide in the gaseous mixture available for escape.

(3) The volume used as the escape rate in determining the radius of exposure shall be that specified in subparagraph (A) - (E) of this paragraph, as applicable.

(A) The maximum daily volume rate of gas containing hydrogen sulfide handled by that system element for which the radius of exposure is calculated.

(B) For existing gas wells, the current adjusted open-flow rate, or the operator's estimate of the well's capacity to flow against zero back-pressure at the wellhead shall be used.

(C) For new wells drilled in developed areas, the escape rate shall be determined by using the current adjusted open-flow rate of offset wells, or the field average current adjusted open-flow rate, whichever is larger.

(D) The escape rate used in determining the radius of exposure shall be corrected to standard conditions of 14.65 pounds per square inch (psia) and 60 degrees Fahrenheit.

(E) For intentional releases from pipelines and pressurized vessels, the operator's estimate of the volume and release rate based on the gas contained in the system elements to be de-pressured.

(4) For the drilling of a well in an area where insufficient data exists to calculate a radius of exposure, but where hydrogen sulfide may be expected, then a 100 ppm radius of exposure equal to 3,000 feet shall be assumed. A lesser-assumed radius may be considered upon written request setting out the justification for same.

(5) Storage tank provision: storage tanks which are utilized as a part of a production operation, and which are operated at or near atmospheric pressure, and where the vapor accumulation has a hydrogen sulfide concentration in excess of 500 ppm, shall be subject to the following.

(A) No determination of a radius of exposure shall be made for storage tanks as herein described.

(B) A warning sign shall be posted on or within 50 feet of the facility to alert the general public of the potential danger.

(C) Fencing as a security measure is required when storage tanks are located inside the limits of a townsite or city, or where conditions cause the storage tanks to be exposed to the public.

(D) The warning and marker provision, paragraph (6)(A)(i), (ii), and (iv) of this subsection.

(E) The certificate of compliance provision, subsection (d)(1) of this section.

(6) All operators whose operations are subject to this section, and where the 100 ppm radius of exposure is in excess of 50 feet, shall be subject to the following.

(A) Warning and marker provision.

(i) For above-ground and fixed **surface facilities**, the operator shall post, where permitted by law, clearly visible warning signs on access roads or public streets, or roads which provide direct access to facilities located within the area of exposure.

(ii) In **populated areas** such as cases of townsites and cities where the use of signs is not considered to be acceptable, then an alternative warning plan may be approved upon written request to the commission.

(iii) For **buried lines** subject to this section, the operator shall comply with the following.

(I) A marker sign shall be installed at public road crossings.

(II) Marker signs shall be installed along the line, when it is located within a public area or along a public road, at intervals frequent enough in the judgment of the operator so as to provide warning to avoid the accidental rupturing of line by excavation.

(III) The marker sign shall contain sufficient information to establish the ownership and existence of the line and shall indicate by the use of the words "Poison Gas" that a potential danger exists. Markers installed in compliance with the regulations of the federal Department of Transportation shall satisfy the requirements of this provision. Marker signs installed prior to the effective date of this section shall be acceptable provided they indicate the existence of a potential hazard.

(iv) In satisfying the sign requirement of clause (i) of this subparagraph, the following will be acceptable.

(I) Sign of sufficient size to be readable at a reasonable distance from the facility.

(II) New signs constructed to satisfy this section shall use the language of "Caution" and "Poison Gas" with a black and yellow color contrast. Colors shall satisfy Table I of American National Standard Institute Standard 253.1-1967. Signs installed to satisfy this section are to be compatible with the regulations of the federal Occupational Safety and Health Administration.

(III) Existing signs installed prior to the effective date of this section will be acceptable if they indicate the existence of a potential hazard.

(B) Security provision.

(i) Unattended fixed surface facilities shall be protected from public access when located within 1/4 mile of a dwelling, place of business, hospital, school, church, government building, school bus stop, public park, town, city, village, or similarly populated area. This protection shall be provided by fencing and locking, or removal of pressure gauges and plugging of valve opening, or other similar means. For the purpose of this provision, surface pipeline shall not be considered as a fixed surface facility.

(ii) For well sites, fencing as a security measure is required when a well is located inside the limits of a townsite or city, or where conditions cause the well to be exposed to the public.

(iii) The fencing provision will be considered satisfied where the fencing structure is a deterrent to public access.

(C) Materials and equipment provision.

(i) For new construction or modification of facilities (including materials and equipment to be used in drilling and workover operations) completed or contemplated subsequent to the effective date of this section, the metal components shall be those metals which have been selected and manufactured so as to be resistant to hydrogen sulfide stress cracking under the operating conditions for which their use is intended, provided that they satisfy the requirements described in the latest editions of NACE Standard MR-01-75 and API RP-14E, sections 1.7(c), 2.1(c), 4.7. The handling and installation of materials and equipment used in hydrogen sulfide service are to be performed in such a manner so as not to induce susceptibility to sulfide stress cracking. Other materials which are nonsusceptible to sulfide stress cracking, such as fiberglass and plastics, may be used in hydrogen sulfide service provided such materials have been manufactured and inspected in a manner which will satisfy the latest published, applicable industry standard, specifications, or recommended practices.

(ii) Other materials and equipment (including materials and equipment used in drilling and workover operations) which are not included within the provision of clause (i) of this subparagraph may be used for hydrogen sulfide service provided:

(I) such materials and equipment are proved, as the result of advancements in technology or as the result of control and knowledge of operating conditions (such as temperature and moisture content), to be suitable for the use intended and where such usage is technologically acceptable as good engineering practice; and

(II) the commission has approved the use of said materials and equipments for the specific uses after written application.

(iii) Existing facilities (including materials in present common usage for drilling and workover operations in hydrogen sulfide areas) which are in operation prior to the effective date of this section, and where there has been no failure of existing equipment attributed to sulfide stress cracking, shall satisfy the requirements of this section.

(iv) In the event of a failure of any element of an existing system as the result of hydrogen sulfide stress cracking, the compliance status of the system shall be determined by the commission after the operator has submitted to the commission a detailed written report on the failure.

(7) All operations subject to subsection (a) of this section shall be subject to the additional control and equipment safety provision, paragraph (8) of this subsection, and the contingency plan provision, paragraph (9) of this subsection, if any of the following conditions apply:

(A) the 100 ppm radius of exposure is in excess of 50 feet and includes any part of a "public area" except a public road;

(B) the 500 ppm radius of exposure is greater than 50 feet and includes any part of a public road;

(C) the 100 ppm radius of exposure is greater than 3,000 feet.

(8) Control and equipment safety provision. Operators subject to this provision shall install safety devices and maintain them in an operable condition or shall establish safety procedures designed to prevent the undetected continuing escape of hydrogen sulfide. For intentional releases of a potentially hazardous volume of hydrogen sulfide gas, the gas must be flared unless permission to vent is obtained from the commission or its delegate. Venting will be allowed only upon a showing that the venting will not pose an unreasonable risk of harm to the public.

(9) Contingency plan provision.

(A) All operators whose operations are subject to this provision shall develop a written contingency plan complete with all requirements before hydrogen sulfide operations are begun.

(B) The purpose of the contingency plan shall be to provide an organized plan of action for alerting and protecting the public prior to an intentional release, or following the accidental release of a potentially hazardous volume of hydrogen sulfide.

(C) The contingency plan shall be activated prior to an intentional release, or immediately upon the detection of an accidental release of a potentially hazardous volume of hydrogen sulfide.

(D) Conditions that might exist in each area of exposure shall be considered when preparing a contingency plan.

(E) The plan shall include instructions and procedures for alerting the general public and public safety personnel of the existence of an emergency.

(F) The plan shall include procedures for requesting assistance and for follow-up action to remove the public from an area of exposure.

(G) The plan shall include a call list which shall include the following as they may be applicable:

(i) local supervisory personnel;

(ii) county sheriff;

(iii) Department of Public Safety;

(iv) city police;

(v) ambulance service;

(vi) hospital;

(vii) fire department;

(viii) doctors;

(ix) contractors for supplemental equipment;

(x) district Railroad Commission office;

(xi) the appropriate regional office of the Texas Commission on Environmental Quality or its successor agencies;

(xii) other public agencies.

(H) The plan shall include a plat detailing the area of exposure. The plat shall include the locations of private dwellings or residential areas, public facilities, such as schools, business locations, public roads, or other similar areas where the public might reasonably be expected within the area of exposure.

(I) The plan shall include names and telephone numbers of residents within

the area of exposure, except in cases where the reaction plan option has been approved by the commission in accordance with subparagraph (L) of this paragraph.

(J) The plan shall include a list of the names and telephone numbers of the responsible parties for each of the possibly occupied public areas, such as schools, churches, businesses, or other public areas or facilities within the area of exposure.

(K) The plan shall include provisions for advance briefing of the public within an area of exposure. Such advance briefing shall include the following elements:

(i) the hazards and characteristics of hydrogen sulfide;

(ii) the necessity for an emergency action plan;

(iii) the possible sources of hydrogen sulfide within the area of exposure;

(iv) instructions for reporting a gas leak;

(v) the manner in which the public will be notified of an emergency;

(vi) steps to be taken in case of an emergency.

(L) In the event of a high density of population, or the case where the population density may be unpredictable, a reaction type of plan, in lieu of advance briefing for public notification, will be acceptable. The reaction plan option must be approved by the commission.

(M) The plan shall include additional support information, if applicable, such as:

(i) location of evacuation routes;

(ii) location of safety and life support equipment;

(iii) location of hydrogen sulfide containing facilities;

(iv) location of nearby telephones and/or other means of communication; and

(v) special instructions for conditions at a particular installation such as local terrain and the effect of various weather conditions.

(N) The Railroad Commission District Office shall be notified as follows if the contingency plan is activated:

(i) 12 hours in advance of an intentional release or as soon as a decision is made to release if such decision could not reasonably have been made more than 12 hours prior to the release;

(ii) immediately in the case of an accidental release;

(iii) as soon as possible before or after an unplanned intentional release made in an emergency situation to prevent a possible uncontrolled release.

(O) The retention of the contingency plan shall be as follows.

(i) The plan shall be available for commission inspection at the location indicated on the certificate of compliance.

(ii) The plan shall be retained at the location which lends itself best to activation of the plan.

(P) In the event that, due to particular situations, a contingency plan cannot be developed consistent with the provisions of this paragraph, relating to the contingency plan, then the operator may develop an adjusted plan to fit the situation, and submit same with the certificate of compliance. Approval of the certificate of compliance so submitted will constitute approval of the contingency plan.

(Q) The plan shall be kept updated to insure its current applicability.

(10) Injection provision.

(A) Injection of fluids containing hydrogen sulfide shall not be allowed under the conditions specified in this provision unless first approved by the commission after public hearing:

(i) where injection fluid is a gaseous mixture, or would be a gaseous mixture in the event of a release to the atmosphere, and where the 100 ppm radius of exposure is in excess of 50 feet and includes any part of a public area except a public road; or, if the 500 ppm radius of exposure is in excess of 50 feet and includes any part of a public road; or if the 100 ppm radius of exposure is 3,000 feet or greater;

(ii) where the hydrogen sulfide content of the gas or gaseous mixture to be injected has been increased by a processing plant operation.

(B) Each project involving the injection of gas or gaseous mixtures containing hydrogen sulfide which does not require a public hearing prior to receiving commission approval specified in this provision shall nevertheless be subject to the other provisions of this section to the extent that such provisions are applicable to such project.

(11) In addition to any other requirements of this section, drilling and workover operations, and gasoline plant sites where the 100 ppm radius of exposure is 50 feet or greater shall be subject to the following.

(A) Protective breathing equipment shall be maintained in two or more locations at the site.

(B) Wind direction indicators shall be installed at strategic locations at or near the site and be readily visible from the site.

(C) Automatic hydrogen sulfide detection and alarm equipment that will warn of the presence of hydrogen sulfide gas in concentrations that could be harmful shall be utilized at the site.

(12) Drilling provision. Drilling and workover operations where the 100 ppm radius of exposure includes a public area or is 3,000 feet or greater shall be subject to the following additional provisions.

(A) Protective breathing equipment shall be maintained at the well site and shall be sufficient to allow for well control operations.

(B) The operator shall provide a method of igniting the gas in the event of an uncontrollable emergency.

(C) The operator shall install a choke manifold, mud-gas separator, and flare line, and provide a suitable method for lighting the flare.

(D) Secondary remote control of blowout prevention and choke equipment to be located away from the rig floor at a safe distance from the wellhead.

(E) Drill stem testing of hydrogen sulfide zones is
permitted only in daylight hours.

(F) The Railroad Commission district office shall be notified of the intention to conduct a drill stem test of a formation containing hydrogen sulfide in sufficient concentration to meet the requirements of this provision.

(G) A certificate of compliance shall be required on each well subject to this provision even if well is located on certificated lease.

(H) Full compliance with all the requirements of this provision must be satisfied before the well is drilled to a depth that is within 1,000 feet of the hydrogen

sulfide zone. Alternate depths may be approved in advance by the appropriate commission district office.

(I) API Publication RP-49 is referenced as a suggested guideline for drilling and workover of wells subject to this provision.

(J) Blowout preventers and well control systems shall be pressure tested at or near compliance depth or at depth of nearest bit change prior to reaching compliance depth. The appropriate Railroad Commission district office must be notified at least four hours prior to the test.

(13) Training requirement provision.

(A) Each operator whose operations contain hydrogen sulfide in excess of 100 ppm shall train its employees working in the affected areas in hydrogen sulfide safety.

(B) Each operator shall require all service companies working in affected areas to utilize only those service company personnel who have been trained in accordance with the provisions of subparagraphs (C) and (D) of this paragraph. Written certification to the operator by the service company that only those service company personnel who have been trained in accordance with the training requirement provision will be utilized in affected areas complies with this provision. For this provision, service company shall mean any company actually performing work at well sites, gasoline plant sites, or on pipelines, where such work could allow the escape of hydrogen sulfide gas.

(C) The training of all personnel working in the affected areas shall include the following elements:

(i) hazards and characteristics of hydrogen sulfide;

(ii) safety precautions;

(iii) operation of safety equipment and life support system.

(D) On-site supervisory personnel shall be additionally trained in the following:

(i) effect of hydrogen sulfide on metal components in the system;

(ii) corrective action and shutdown procedures, and when drilling a well, blowout prevention, and well control procedures;

(iii) must have full knowledge of the requirements of the contingency plan, when such plan is required.

(E) Training schedules and course outlines shall be provided to the commission personnel upon request for the purpose of commission review to determine compliance with the provisions of subparagraphs (C) and (D) of this paragraph.

(14) Accident notification. Operators shall immediately notify the appropriate Railroad Commission District Office of any accidental release of hydrogen sulfide gas of sufficient volume to present a hazard and of any hydrogen sulfide related accident.

(d) Reports required.

(1) Certificate of compliance provision. A certificate of compliance shall be submitted for operations subject to any provision of this section. The following shall apply to the certificate of compliance provision of the section.

(A) The certificate of compliance shall certify that operator has complied or will comply with applicable provisions of this section.

(B) The certificate of compliance shall be filed in triplicate in the commission district office where the operation is located.

(C) The certificate of compliance shall certify that existing operations subject to this section to be in compliance will be in compliance as specified in an attached schedule, or, for new or modified facilities, will be in compliance upon completion.

(D) An approved certificate of compliance will permit an operator to perform all activities described in the certificate without additional filing of approval; provided that, consistent with subsection (c)(12)(G) of this section, a certificate of compliance will be required on each well subject to the provisions of subsection (c)(12)(G) of this section.

(E) A new or amended certificate of compliance shall be required if there is a change in public exposure caused by public infringement of an existing radius of exposure resulting in a change in the applicable provisions of this section, not described by the existing certificate. The operator shall file the new or amended certificate within 30 days after such infringement.

(F) A new or amended certificate of compliance shall be required if there is modification of an existing operation or facility which increases the radius of exposure in a public area, or results in a change in the applicable provisions of this section not described by the existing certificate. The operator shall file the new or amended certificate at least 30 days prior to initiating the operation or construction.

(G) The operator shall file a certificate of compliance 30 days prior to commencement of a drilling or workover operation on wells where a certificate of compliance is required for that well by provisions of this section (wells drilled on noncertificated leases or wells with a 100 ppm radius of exposure greater than 3,000 feet).

(H) In case of extenuating circumstances, an operator may file a certificate of compliance with an attached written explanation for those cases where waiver of 30-day prior filing is requested. In such cases, the approval of the certificate of compliance will constitute authority to proceed.

(I) The certificate of compliance shall be prepared and executed by a party who, through training and experience, is qualified to make such certification.

(J) The certificate of compliance will be in effect until conditions are altered in a manner that would require amending the "certificate." The operator shall notify the commission within 30 days following cessation or abandonment of operations in a certificated area.

(K) The certificate of compliance required by the provisions of this order for an existing system are due in the district office as soon as is reasonably possible, and no later than September 1, 1976, and as applicable for new or modified operations.

(L) A certificate of compliance may cover a single operation or multiple operations located in an area, a field, or a group of fields within a commission district. The description of the type of operation as indicated on the form must be sufficiently complete to the degree that it is obvious what element of an operation is to be covered by the certificate. All Railroad Commission identification numbers for each element of the system must be shown on the certificate and must be identified as to the type of operation.

(M) Certificates are nontransferable, and a new operator of a system or any acquired element of a system or operation shall be required to certificate that operation. Operator of a certificated system shall notify the commission in writing when the system or any operating part has been transferred to another operator. An amended certificate shall be required should any change occur that would add or delete a Railroad Commission identification number covered by the certificate.

(N) Each operator shall maintain a current master list of all his operations for which a certificate of compliance is in effect and shall submit such list for inspection upon request by the commission.

(2) Completion report provision.

(A) The operator shall report on the initial completion report for new oil or gas wells the hydrogen sulfide concentrations of the wellhead gas for all wells where the hydrogen sulfide concentration is equal to or exceeds 100 ppm.

(B) The drilling of a well in an area which would require the submission of a certificate of compliance (Form H-9) shall have noted on the drilling application (Form W-1) that such certification has been filed.

(3) Releases of, and accidents related to, hydrogen sulfide. The operator shall furnish a written report to the district office within ten days of any accidental release of hydrogen sulfide gas of sufficient volume to present a hazard and of any hydrogen sulfide related accident, whether it be from an accidental or intentional release.

(e) Exception provision. Any application for exception to the provisions of this section should specify the provisions to which exception is requested, and set out in detail the basis on which the exception is to be requested.

SOURCE: The provisions of this §3.36 adopted January 1, 1976; amended to be effective September 1, 1976, 1 TexReg 1517; amended to be effective September 15, 1985, 10 TexReg 2069; amended to be effective April 7, 1995, 20 TexReg 2285; amended to be effective November 24, 2004, 29 TexReg 10728