

# **General Order No. 112-E**

**State of California Rules Governing Design, Construction,  
Testing, Operation, and Maintenance of Gas Gathering,  
Transmission, and Distribution Piping Systems.**



**California Public Utilities Commission**

August 21, 2008

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## **GENERAL ORDER NO. 112-E**

### **PUBLIC UTILITIES COMMISSION *of the* STATE OF CALIFORNIA**

#### **RULES GOVERNING DESIGN, CONSTRUCTION, TESTING, MAINTENANCE, AND OPERATION OF UTILITY GAS GATHERING, TRANSMISSION, AND DISTRIBUTION PIPING SYSTEMS**

**CHANGE LIST-FOLLOWING IS THE LIST OF DECISIONS AND RESOLUTIONS WHICH  
AUTHORIZED CHANGES TO GENERAL ORDER 112 APPLICABLE TO GAS UTILITIES:**

<b>Decision or Resolution No.</b>	<b>Date Effective</b>	<b>Sections Herein Modified Amended or Added</b>
Decision No. 61269	July 1, 1961	Adopted General Order 112 on December 28, 1960
Decision No. 66399	January 1, 1964	Adopted General Order 112-A on December 3, 1963
Decision No. 73223	December 1, 1967	Adopted General Order 112-B on October 24, 1967
Decision No. 78513	April 30, 1971	Adopted General Order 112-C on April 2, 1971
Decision No. 80268	July 18, 1972	Subpart I of Part 192 of Title 49 of CFR and Sections 192.607 And 192.611 (e)
Decision No. 82467	Feb. 13, 1974	192.12, 192.3, 192.379, 192.55, 192.65, 192.201(a), 192.717(b), 192.727 and Appendices A and B
Decision No. 85280	Dec. 30, 1975	192.59, 192.65, 192.225, 192.229, 192.241, 192.705, 192.706, 192.707 and Appendices A and B
Decision No. 85375	Jan. 27, 1976	192.229 (c)
Decision No. 86874	Jan. 18, 1977	192.3, 192.5, 192.13, 192.111, 192.145, 192.163, 192.167, 192.179, 192.225, 192.227, 192.243, 192.313, 192.317, 192.319, 192.327, 192.451, 192.465, 192.469, 192.481, 192.615, 192.619, 192.707, 192.713, 192.717, 192.727, 192.753, 192.755 and Appendices A and B
Decision No. 90372	June 5, 1979	Adopted General Order No. 112-D in OII No. 1 on June 5, 1979
Decision No. 90921	November 22, 1979	192.13, 192.14, 192.63, 192.121, 192.123, 192.313, 192.451, 192.452, 192.457, 192.465, 192.467, 192.473, 192.475, 192.477, 192.479, 192.481, 192.485, 192.491, 192.619 and Part II Appendices A and B
Decision No. 93791	December 1, 1981	192.121, 192.179, 192.281, 192.283, 192.285, 192.287, 192.455, 192.465 and Part II Appendix A
Decision No. 83-10-039	October 19, 1983	192.745 and 192.747
Decision No. 84-04-008	April 4, 1984	192.3, 192.227, 192.465, 192.477, 192.481, 192.704, 192.705, 192.706, 192.721, 192.723, 192.731, 192.739, 192.743, 192.745, 192.747 and 192.749
Decision No. 84-05-004	May 2, 1984	192.3, 192.7, 192.59, 192.113, 192.117, 192.123, 192.145, 192.163, 192.197, 192.225, 192.227, 192.229, 192.237, 192.239, 192.241, Part II Appendix A, Part II Appendix B, and Table of Contents
Decision No. 84-06-002	June 6, 1984	192.59, and 192.123
Decision No. 84-06-028	June 6, 1984	192.465
Decision No. 85-03-012	March 6, 1985	192.144, 192.283, 192.614, 192.707, 193.1015, II H, Part III Appendix A and Table of Contents
Decision No. 86-06-047	June 25, 1986	192.105, 192.143, 192.243, 192.245 and 192.313
Decision No. 88-11-023	November 9, 1988	192.55, 192.113, 192.223, 192.225, 192.227, 192.237, 192.239, 192.611, 192.719, 192.743, Part II Appendices A and B, Table of Contents and Index

Decision No. 95-08-053	September 11, 1995	Adopted General Order 112-E in Application 93-08-053 on August 11, 1995 and Modified Sections 101, 101.2, 101.3, 101.4, 102.1, 102.2, 103.1, 104.1, 105, 121.1, 122.1, 122.2, 123.1, 124.1, 125.1, 125.2, 126.1, 141.1, 142.1, 143.1, 143.2, 144.1, 161.1, 162.1, 162.2, 162.3, 181.1, 182.1, 182.2, 182.3, 182.4, 182.5, 182.6, 182.7, 182.8, 183.1, 183.2, 183.3, 183.4, 183.5, 201.1, 202.2, Appendix A and Appendix B
Resolution No. SU-41	May 22, 1996	Eliminated existing section 122.2 (c) and renumbered following sections
Resolution No. E-4184	August 21, 2008	Modified reporting requirements in Section 122.2 to provide for reporting via the Worldwide Web; Removed obsolete Appendix C

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GENERAL PROVISIONS**

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## **SUBPART A - GENERAL**

### **101 PREAMBLE**

**101.1** This General Order shall be known as the "State of California Rules Governing Design, Construction, Testing, Operation, and Maintenance of Gas Gathering, Transmission, and Distribution Piping Systems." It will be referred to herein as "these rules."

**101.2** These rules are incorporated in addition to the Federal Pipeline Safety Regulations, specifically, Title 49 of the Code of Federal Regulations (49 CFR), Parts 190, 191, 192, 193, and 199, which also govern the Design, Construction, Testing, Operation, and Maintenance of Gas Piping Systems in the State of California. These rules do not supercede the Federal Pipeline Safety Regulations, but are supplements to the Federal Regulations.

**101.3** There shall be no deviation from this General Order except after authorization by the Commission. If hardship results from application of any rule herein prescribed because of special circumstances, application may be made to the Commission to waive compliance with such rule in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act of 1968. Each request for such waiver shall be accompanied by a full and complete justification.

**101.4** The utilities shall maintain the necessary records to ensure compliance with these rules and the Federal Pipeline Safety Regulations, 49 CFR, that are applicable. Such records shall be available for inspection at all times by the Commission or Commission Staff.

### **102 PURPOSE**

**102.1** The purpose of these rules is to establish, in addition to the Federal Pipeline Safety Regulations, minimum requirements for the design, construction, quality of materials, locations, testing, operations and maintenance of facilities used in the gathering, transmission and distribution of gas and in liquefied natural gas facilities to safeguard life or limb, health, property and public welfare and to provide that adequate service will be maintained by gas utilities operating under the jurisdiction of the commission.

**102.2** These rules are concerned with safety of the general public and employees' safety to the extent they are affected by basic design, quality of the materials and workmanship, and requirements for testing and maintenance of gas gathering, transmission and distribution facilities and liquefied natural gas facilities.

## **103 INTENT**

**103.1** The requirements of these rules, in addition to the Federal Pipeline Safety Regulations, are adequate for safety under conditions normally encountered in the gas industry. Requirements for abnormal or unusual conditions are not specifically proscribed. It is intended that all work performed within the scope of these rules shall meet or exceed the safety standards expressed or implied herein.

**103.2** Existing industrial safety regulations pertaining to work areas, safety devices, and safe work practices are not intended to be supplanted by these rules.

**103.3** Compliance with these rules is not intended to relieve a utility from any statutory requirements.

**103.4** The establishment of these rules shall not impose upon utilities, and they shall not be subject to any civil liability for damages, which liability would not exist at law if these rules had not been adopted.

## **104 PROCEDURES FOR KEEPING GENERAL ORDER UP-TO-DATE**

**104.1** It is the intent of the California Public Utilities Commission to automatically incorporate all revisions to the Federal Pipeline Safety Regulations, 49 CFR Parts 190, 191, 192, 193, and 199 with the effective date being the date of the final order as published in the Federal Register.

**104.2** In those instances where additional or more stringent specific state rules are appropriate, the gas utilities subject to these rules may file an application to update provisions, rules, standards and specifications of the General Order as they deem necessary to keep this General Order current in keeping with the purpose and intent thereof. However, nothing herein shall preclude other interested parties from initiating appropriate formal proceedings to have the Commission consider any changes they deem appropriate, or the Commission from acting upon its own motion.

## **105 DEFINITIONS**

Commission means the Public Utilities Commission of the State of California.

Holders means any structure used to store gas, which either has a displacement of 500 or more cubic feet, or will contain 10,000 or more standard cubic feet of gas at its maximum design pressure, except that a pipeline which is used primarily for transmission or distribution of gas, but which also serves a storage function, is not a holder for purposes of this General Order.



Inert gas means a gas which will not burn or support combustion, such as nitrogen, carbon dioxide or mixtures of such gases.

Utility means any person, firm, or corporation engaged as a public utility in transporting natural gas, hydrocarbon gas or any mixture of such gases for domestic, commercial, industrial, or other purposes.

## **SUBPART B - REPORTS**

### **121 GENERAL**

**121.1** In order that the Commission may be informed concerning the operation and the status of the more important facilities of the utilities, the following information shall be filed with the Commission.

### **122 GAS INCIDENT REPORTS**

**122.1** Each operator shall comply with the requirements of 49 CFR Part 191, for the reporting of incidents to the United States Department of Transportation (DOT). The operator shall submit such reports directly to the DOT, with a copy to the California Public Utilities Commission (CPUC).

**122.2** Requirements for reporting to the CPUC.

(a) Each operator shall report incidents to the CPUC that meet the following criteria:

1. Incidents which require DOT notification.
  - i. An event that involves a release of gas from a pipeline or of liquefied natural gas (LNG) or gas from an LNG facility and
    - A death, or personal injury necessitating in-patient hospitalization; or
    - Estimated property damage, including cost of gas lost, of the operator or others, or both, of \$50,000 or more.
  - ii. An event that results in an emergency shutdown of an LNG facility.
2. Incidents which have either attracted public attention or have been given significant news media coverage, that are suspected to involve natural gas, which occur in the vicinity of the operator's facilities; regardless of whether or not the operator's facilities are involved.

(b) In the event of an incident listed in 122.2(a) above, an operator shall go to the Commission's website, select the link to the page for reporting emergencies and follow the instructions thereon. If internet access is unavailable, the Operator may report using the backup telephone system.

1. If the utility is notified of the incident during its normal working hours, the report should be made as soon as practicable but no longer than 2 hours after the utility is aware of the incident and its personnel are on the scene.
2. If the utility is notified of the incident outside of its normal working hours, the report should be made as soon as practicable but no longer than 4 hours after the utility is aware of the incident and its personnel are on the scene.

3. All reports required by this section shall be followed by the end of the next working day by an email or telefacsimile (fax) of the standard reporting form, "Report of Gas Leak or Interruption," CPUC File No. 420 (see attachment).

(c) Written Incident Reports .

1. The operator shall submit to the CPUC on DOT Form PHMSA\_F7100.1 (<http://ops.dot.gov/library/forms/forms.htm#7100.1>) for distribution systems and on DOT Form PHMSA F7100.2 (<http://ops.dot.gov/library/forms/forms.htm#7100.2>) for transmission and gathering systems a report describing any incident that required notice under Items 122.2(a)(1) or (2).
2. Together with the form required by (c)(1) above, the operator shall furnish a letter of explanation giving a more detailed account of the incident unless such letter is deemed not necessary by the CPUC staff. The operator may confirm the necessity of a letter of explanation by telephone. If, subsequent to the initial report or letter, the operator discovers significant additional information related to the incident, the operator shall furnish a supplemental report to the CPUC as soon as practicable, with a clear reference by date and subject to the original report. These letters, forms, and reports shall be held confidential under the provisions of Paragraph 2, Exclusions, of General Order 66-C and Public Utilities Code Section 315.
3. The operator of a distribution system serving less than 100,000 customers need not submit the DOT forms required by paragraph (1) above; however, such operator must submit the letter of explanation required by (2) above, subsequent to any initial report to the CPUC, unless such letter is deemed unnecessary by the CPUC staff.

(d) Quarterly Summary Reports. Each operator shall submit to the CPUC quarterly, not later than the end of the month following the quarter, a summary of all CPUC reportable and non-reportable gas leak related incidents which occurred in the preceding quarter as follows:

1. Incidents that were reported through the Commission's Emergency Reporting website.
2. Incidents for which either a DOT Form PHMSA F7100.1 or F7100.2 was submitted.
3. Incidents which involved escaping gas from the operator's facilities and property damage including loss of gas in excess of \$1,000.
4. Incidents which included property damage between \$0 and \$1,000, and involved fire, explosion, or underground dig-ins.

## **123 ANNUAL REPORTS**

**123.1** Each operator shall submit to the DOT, with a copy to the CPUC, annual reports required by sections 191.11 and 191.17 of 49 CFR Part 191. Such reports shall be submitted in the manner prescribed in 49 CFR Part 191.

## **124 REPORTING SAFETY-RELATED CONDITIONS**

**124.1** The requirements of paragraphs 191.1, 191.7, 191.23, and 191.25 in 49 CFR Part 191, to report specified safety-related conditions, are incorporated by references as part of these rules. Copies of all reports submitted to the Secretary of Transportation pursuant to the foregoing requirements shall be submitted to the Commission concurrently.

## **125 PROPOSED INSTALLATION REPORT**

**125.1** At least 30 days prior to the construction of a new pipeline, or the reconstruction or reconditioning of an existing pipeline, to be operated at hoop stresses of 20 percent or more of the specified minimum yield strength of the pipe used, a report shall be filed with the commission setting forth the proposed route and general specifications for such pipeline. The specifications shall include but not be limited to the following items:

- (a) Description and purpose of the proposed pipeline.
- (b) Specifications covering the pipe selected for installation, route map segregating incorporated areas, class locations and design factors, terrain profile sketches indicating maximum and minimum elevations for each test section of pipeline, and, when applicable, reasons for use of casing or bridging where the minimum cover will be less than specified in 192.327.
- (c) Maximum allowable operating pressure for which the line is being constructed.
- (d) Fluid and pressure to be used during proof strength testing.
- (e) Protection of pipeline from hazards as indicated in 192.317 and 192.319.
- (f) Protection of pipeline from external corrosion.
- (g) Estimated cost with supporting detail.

For utilities with less than 50,000 services in the state of California according to the Annual DOT Report, Form RSPA F 7100.1-1 that is required by 49 CFR 191.11, the Proposed Installation Report shall be submitted to the Commission for any installation that is estimated to cost \$1,000,000 or more. The Annual DOT Report referenced above shall be the report for the previous year to the proposed installation.

For utilities with 50,000 services or more in the state of California according to the Annual DOT Report, Form RSPA F 7100.1-1 required by 49 CFR 191.11, the Proposed Installation Report shall be submitted to the Commission for any installation that is estimated to cost \$2,500,000 or more. The Annual DOT Report referenced above shall be the report for the previous year to the proposed installation.

**125.2** During strength testing of a pipeline to be operated at hoop stresses of 20 percent or more of the specified minimum yield strength of the pipe used, any failure shall be reported on appropriate forms established by the Secretary of Transportation to comply with the requirement of 191.15, Part 191, Title 49 of CFR.

## **126 CHANGE IN MAXIMUM ALLOWABLE OPERATING PRESSURE**

**126.1** Except as provided in **(126.2)** below, at least 30 days prior to an increase in the maximum allowable operating pressure of a pipeline, a report shall be filed with the Commission for:

- a) A pipeline operating at or to be operated at a hoop stress of 20 percent or more of the specified minimum yield strength of the pipe being up rated.
- b) 2,500 feet or more of distribution main which is to be up rated from a MAOP less than or equal to 60 psig to a MAOP greater than 60 psig.
- c) The conversion of 5,000 feet or more of low pressure distribution main to high pressure distribution main.

The report shall include:

- i) the new maximum allowable operating pressure
- ii) the reasons for the change
- iii) the steps taken to determine the capability of the pipeline to withstand such an increase

**126.2** The requirements of **(126.1)** above do not apply to the up rating or conversion of low pressure distribution mains serving less than 300 customers accomplished by connecting the service lines individually to a higher pressure main.

## **SUBPART C - CONSTRUCTION & SAFETY STANDARDS**

### **141 GENERAL**

**141.1** Each operator shall comply with the requirements of 49 CFR part 192 Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards. This section of the General Order addresses specific construction, testing, and safety standards in addition to those included in 49 CFR Part 192. These rules do not supercede the Federal Pipeline Safety Regulations, but are supplements to them.

### **142 PLASTIC PIPE**

**142.1 Plastic Pipe Storage** - At the time of installation, plastic pipe to be used for gas transportation, shall not have been subjected to unprotected outdoor exposure longer than the time recommended by the manufacturer.

### **143 DISTRIBUTION SYSTEMS**

**143.1 Leakage Surveys and Procedures** - A gas detector survey must be conducted in business districts and in the vicinity of schools, hospitals and churches, including tests of the atmosphere in gas, electric, telephone, sewer and water system manholes, at cracks in pavement, and sidewalks, and at other locations providing an opportunity for finding gas leaks, at intervals not exceeding 15 months, but at least once each calendar year.

**143.2 Valve Maintenance** - Each valve, the use of which may be necessary for the safe operation of a distribution system, must be inspected, serviced, lubricated (where required) and partially operated at intervals not exceeding 15 months, but at least once each calendar year.

### **144 TEST REQUIREMENTS FOR PIPELINES TO OPERATE BELOW 100 p.s.i.g.**

**144.1** Except for service lines and plastic pipelines, each segment of a pipeline that is to be operated below 100 p.s.i.g. must be leak tested in accordance with 49 CFR 192.509 and the following:

- (a) Each main that is to be operated at less than 1 p.s.i.g. must be tested to at least 10 p.s.i.g.
- (b) Each main to be operated at or above 1 p.s.i.g. but less than 60 p.s.i.g. must be tested to at least 90 p.s.i.g.
- (c) Each main to be operated at or above 60 p.s.i.g. but less than 100 p.s.i.g. must be tested to a minimum of 1.5 times the proposed MAOP.

## **SUBPART D - LNG**

### **161 GENERAL**

**161.1** Each operator shall comply with the requirements of 49 CFR part 193 - Liquefied Natural Gas Facilities: Federal Safety Standards. This section of the General Order addresses specific standards for the design, construction, testing, operation, and maintenance of liquefied natural gas facilities in addition to those included in 49 CFR Part 193. These rules do not supercede the Federal Pipeline Safety Regulations, but are supplements to them.

### **162 LIQUEFIED NATURAL GAS FACILITIES**

**162.1** Except for a pipeline facility in operation or under construction before January 1, 1973, no operator may store, treat, or transfer liquefied natural gas in a pipeline facility unless that pipeline facility meets the applicable requirements of this part and of NFPA Standard No. 59A.

**162.2** No operator may store, treat, or transfer liquefied natural gas in a pipeline facility in operation or under construction before January 1, 1973, unless

- (a) The facility is operated in accordance with the applicable operating requirements of this part and of NFPA Standard 59A; and
- (b) Each modification or repair made to the facility after December 31, 1972, conforms to the applicable requirements of this part and NFPA Standard 59A, insofar as is practicable.

**162.3** The operator, who is planning to build a LNG facility in the state of California, shall notify the Utilities Safety Branch 90 days prior to commencing construction on that LNG facility.

## **SUBPART E - GAS HOLDERS**

### **181 GENERAL**

**181.1** Each operator shall comply with the requirements of 49 CFR part 192 Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards. This section of the General Order addresses specific standards for the design, construction, testing, operation, and maintenance of gas holders in addition to those included in 49 CFR Part 192. These rules do not supercede the Federal Pipeline Safety Regulations, but are supplements to them.

### **182 PIPE-TYPE AND BOTTLE-TYPE HOLDERS: DESIGN AND CONSTRUCTION**

**182.1** All holders shall comply with the requirements of 49 CFR 192.175 and 192.177.

**182.2** Electrical equipment and wiring installed at holders must conform to the National Electrical Code, NFPA-70, so far as that Code is applicable.

**182.3** Any holder designed and constructed in accordance with the requirements for location class 1 or 2, but not 3, shall be installed at least 75 feet from a flammable building or adjoining property that may have a flammable building constructed thereon in the future, or from the nearest rail or a track on a railroad private right-of-way. Also, no utility shall construct or install a flammable building within fifty feet of a holder. (A flammable building shall be understood to be a building, roof or siding of which consist of wood or other readily combustible material.)

**182.4** Each vent line that exhausts gas from a pressure relief valve or blowdown valve must extend to a location where the gas may be discharged without hazard.

**182.5** A device which will maintain a continuous pressure record shall be installed at the inlet or outlet of each holder, except that where a group of holders are jointly connected and are all filled from the same gas source and all empty into a common line or system, only one device will be required. A pressure indicating device shall be installed on each container in the holder.

**182.6** Each holder facility must have adequate fire-protection facilities.

**182.7** Holders shall be provided with overpressure protection systems complying with the requirements of 192.195.

**182.8** When a holder is constructed adjacent to any existing electric transmission line normally carrying voltages in excess of 50,000 volts, the holder shall be located no nearer to the lines than the height of the poles carrying them.



## **183 PIPE-TYPE AND BOTTLE-TYPE HOLDERS: PLAN FOR INSPECTION AND TESTING**

**183.1** All leaks of any consequence in gas pipeline, valves and equipment in the vicinity of a holder must be promptly repaired upon discovery, or as soon as practicable. All hazardous leaks must be remedied at once.

**183.2** In addition to other inspections required by this Part, after a high pressure holder has been in service for a period of ten years, and at intervals not exceeding ten years thereafter, a complete and thorough internal and external inspection shall be made and reported upon by competent inspectors who are selected by the utility and are agreeable to the Commission. A copy of the report shall be provided to the commission.

**183.3** In lieu of an internal inspection, when it is not practical to enter the holder, a sufficient number of plugs shall be cut from, or holes bored in, the shell at points believed most subject to internal corrosion, to enable examination for corrosion. The interior of at least one container of a holder constructed entirely of pipe and fittings shall be inspected by removing the end closures and entering the container.

**183.4** As an alternative to the above requirements to enter the container, or to cut plugs or bore holes in the holder, a nondestructive test procedure such as ultrasonic testing may be used. The test instrument must be calibrated to measure the wall thickness of the steel plates so that the error of indication shall not vary more than plus or minus two thousandths ( $\pm 0.002$ ) of an inch.

**183.5** When such inspections determine that the holders are in a defective and hazardous condition, they shall be taken out of service until repaired and placed in a safe workable condition. All others in the same group shall immediately be inspected and repaired if found defective. If any portion of the shell of a high pressure holder is located underground and exposed to the soil, inspection of its exterior for corrosion and leaks shall be made by suitable representative excavations at the time of the inspection.

## **SUBPART F - PETROLEUM GAS VESSEL STATIONS**

### **201 GENERAL**

Each operator shall comply with the requirements of 49 CFR part 192 -Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards. This section of the General Order addresses specific standards for the design, construction, testing, operation, and maintenance of petroleum gas vessel stations in addition to those included in 49 CFR Part 192. These rules do not supercede the Federal Pipeline Safety Regulations, but are supplements to them.

### **202 PETROLEUM GAS VESSEL STATIONS**

**202.1** For the purpose of this section, vessel shall refer to any structure with a capacity of two hundred gallons or more used for the storage of petroleum gas, but shall not refer to those vessels used for transporting purposes.

**202.2** Each operator having a vessel station shall establish a plan for the systematic routine inspection and testing of these facilities in accordance with Appendix A -Petroleum Gas Vessel Stations: Operation, Maintenance, and Inspection, and shall provide for:

- (a) Effective training of all personnel associated with the maintenance and operation of the facilities.
- (b) Specification of appropriate safe work practices and assurance that those practices are followed.
- (c) Effective liaison with local fire departments and other emergency response agencies to assure that these agencies are familiar with the operating facilities to the extent necessary to assure that any required response from them in an emergency is effective, and to assure that the operator of the facilities is adequately informed of the services that those agencies will provide.

## **APPENDIX A**

### **PETROLEUM GAS VESSEL STATIONS: OPERATION, MAINTENANCE AND INSPECTION**

#### **I. Operation and Maintenance**

1. Before work which might bring about admission of air is performed on any Petroleum Gas vessel, such as removing the vessel from service for internal inspection, internal repairs or dismantling, all inlet and outlet gas connections, except those opening to the atmosphere, shall be physically removed and the vessel shall be purged with inert gases. The closing of inlet and outlet valves or the blanking off of inlet and outlet flanges shall not be considered sufficient precaution against the formation of an explosive mixture while the vessel is out of service.

Before work which might bring about the admittance of air is performed on a petroleum gas vessel, all possible liquid shall be drained there from before purging is begun. A sufficient quantity of steam shall be used to supplement the inert gases used for purging in order to assure the removal of all petroleum gas before the admittance of air. Before workmen are allowed to enter a vessel removed from service and purged with inert gases, the inert gases shall be purged with air, or in lieu thereof, the workmen entering the vessel shall be equipped with self-contained breathing apparatus meeting the requirements of NFPA 19B and maintained in accordance with manufacturer's recommendations.

When the interior of a vessel that has been removed from service and purged of flammable vapors is scraped, brushed, sprayed, painted, or otherwise worked on in a manner that might bring about the formation of an explosive mixture, an adequate and continuous circulation of outside air through the vessel by means of fans or other devices is required.

The circulation of air shall continue until there is no reasonable probability of the formation of an explosive mixture. While engaged in such work, workers must be provided with a safe supply of air to breathe. If conditions warrant, they shall be provided with appropriate respiratory protection.

Upon returning a purged vessel to service, the air shall be purged from the vessel with inert gases before gas or liquid is allowed to reenter the vessel.

All tests to determine the presence of an explosive mixture in connection with the purging of a vessel with inert gases or air, shall be conducted by competent operators by means of adequate specifications and gas analysis apparatus. When gas detection equipment is used, the operator shall calibrate and verify it is in good working order.

Except as herein otherwise provided, it is recommended that all operations set forth in this paragraph, including gas analyses, be performed in accordance with the latest procedure recommended by the American Gas Association Publication, "Purging Principles and Practice."

2. Whenever a vessel is painted, all seams on that portion of the vessel being painted, which are subject to gas pressure, shall be inspected for leaks.

3. Except as herein otherwise provided, all vessels of this type shall be maintained and operated in accordance with the Unfired Pressure Vessel Safety Orders, issued by the Division of Industrial Safety, Department of Industrial Relations of the State of California, and in effect at the time; however, no reconstruction of vessels is required in order to comply with said Unfired Pressure Vessel Safety Orders, if the vessels were acquired prior to April 1, 1940.

4. All valves, fittings, regulators, and pressure relief devices shall be kept in working order and reasonably protected from trespass.

5. The maximum safe operating pressure of the vessel shall be known to the operator. This pressure can be determined from the inspection reports of the State Division of Industrial Safety or other qualified inspectors.

6. All drips and drain lines shall be kept free of obstruction and in proper working order at all times.

7. In order to provide for liquid expansion with temperature, Petroleum Gas storage vessels shall not be filled to a greater fraction of their volumes than is permitted by said Unfired Pressure Vessel Safety Orders, in effect at the time.

8. At stations where equipment is employed for vaporizing the gas, the vaporizer shall be located outside of buildings, unless those buildings are devoted exclusively to Petroleum Gas and distribution operations, are of approved fireproof construction, and are well ventilated from points near the floor and roof.

Any device supplying the necessary artificial heat for producing the steam, hot water, or other heating medium for the gas vaporizers shall be equipped with a full safety shutoff control.

When such devices are located under a common roof with the gas vaporizers, they shall be located in a separate compartment or room, which shall be separated from compartments or rooms containing liquefied petroleum gas vaporizers, pumps, or central gas mixing devices by a fire wall containing no openings through which free vapors might flow. Vaporizers employing artificial heat shall be provided with a safety relief valve of adequate capacity at or near the outlet of the vaporizer. Direct-fired Petroleum Gas vaporizers and heaters shall only be allowed after special authorization has been granted by the Commission.

## II. Inspection Procedures

1. Each utility shall employ a standard set of inspection forms prescribed by the Commission for recording data obtained at the time inspections are made.
2. The annual inspection reports for all vessels shall contain a general summary of the operating condition of the vessel and indicate any changes, repairs, or improvements that appear advisable.
3. The annual general inspection report of each vessel shall include a description and typical analysis of the gas or gases stored therein during the past year. Analyses shall particularly indicate the content of hydrogen sulfide, carbon dioxide, oxygen, and other corrosive impurities.
4. Whenever the internal inspection of a vessel is contemplated, it shall first be removed from service and entered in accordance with the provisions of I. 1.
5. The following minimum inspections shall be made and recorded.

### Annual General Inspection:

General inspection of aboveground vessels for condition, indications of corrosion, and need of painting. Check yard for cleanliness and fencing.

The exposed piping, valves, and fittings of buried vessels shall be examined for general condition, undue strain caused by settlement, and need of painting. All exposed connections, manholes and fittings on vessels, as well as mechanical joints in all exposed piping within fifty feet of any vessel, shall be tested for leaks. All leaks and their disposition shall be shown on the report form. Known or suspected leaks on buried vessels, connections, and fittings shall be uncovered and repaired as soon as practicable. Hazardous leaks shall be repaired at once.

Examination shall be made of foundations and supports for all above ground vessels to ascertain if all saddles and piers are fully supporting the vessel. Any settlement which will produce uneven and excessive strain shall be corrected as soon as practicable to minimize risk to the health and safety of the public.

Check accuracy of liquid gauging equipment. Check operation of vaporizer relief devices. Inspect condition and operation of safety shutoff control on vaporization heating equipment.

## Inspection of Underground Vessels for External Corrosion:

Where a storage vessel is underground and exposed to the soil, inspection of its exterior for soil corrosion and leaks shall be made by suitable representative excavations at least once each ten years.

## Additional Inspections:

Except as hereinafter provided, after a Petroleum Gas vessel has been in service for a period of twenty years, and at intervals not exceeding twenty years thereafter, a complete and thorough internal and external inspection shall be made and reported upon by qualified inspectors, who are selected by the utility and are agreeable to the Commission. For groups of two or more vessels, of the same type of materials and design, built at the same time and subjected during the interval to identical service conditions, no less than twenty percent, nor less than one of the vessels in any such group shall receive the internal inspection after each twenty years of service. If the utility uses the above exception, the vessel or vessels inspected shall be regularly rotated in order that eventually all vessels will have been examined.

When the vessel is buried and/or cannot be entered for an internal inspection, a sufficient number of plugs shall be cut from, or holes bored into, the shell at points believed most subject to internal and/or external corrosion, to enable examination for corrosion.

As an alternative to entering the vessel or to cutting plugs or boring holes in the vessel, a nondestructive test procedure such as ultrasonic testing may be used. The test instrument must be calibrated to measure the wall thickness of the steel plates so that the error of indication shall not vary more than plus or minus two thousandths ( $\pm 0.002$ ) of an inch.

Any vessels found to be in a defective and hazardous condition shall be taken out of service until repaired and placed in a safe workable condition, and any other vessels in the same group shall immediately be inspected and repaired if found necessary.

In the years that the inspections described above are made, the utility will not be required to make the regular annual general inspection.

# APPENDIX B

## CALIFORNIA PUBLIC UTILITIES COMMISSION

Report of Gas Leak or Interruption\*  
CPUC File No. 420

### Part I: CPUC CONTACT INFORMATION

Utility Name: _____	CPUC Contact: Name _____	Recorder <input type="checkbox"/>	FAX <input type="checkbox"/>
Contact Person _____	Date _____	Time: (24hr) _____	
CPUC Information Request: Written Report <input type="checkbox"/>		Sketch/Photo <input type="checkbox"/>	FD Report <input type="checkbox"/>
Phone: _____	DOT Notified - Yes <input type="checkbox"/> No <input type="checkbox"/> DOT Report Number: _____		

### Part II: INCIDENT DETAILS

<u><b>Incident Location</b></u>	<u><b>Incident Time</b></u>	<u><b>Reported to the Utility</b></u>
City/County: _____	Date _____	Date: _____ Time: (24hr) _____
Address/Location: _____	Time: (24hr) _____	Reported by: _____
<u><b>Reason(s) for Reporting</b></u> (check all that apply)		
Gas leak associated with: Death <input type="checkbox"/> Injury <input type="checkbox"/> \$\$Damage <input type="checkbox"/> Media Coverage <input type="checkbox"/> Service Interruption <input type="checkbox"/> Operator Judgment <input type="checkbox"/> Other Emergency actions (describe) _____ Transmission Line Test Failure <input type="checkbox"/> Required Transmission Line Shutdown <input type="checkbox"/>		<u><b>Emergency action required:</b></u> Traffic Rerouted <input type="checkbox"/> Area Blocked Off <input type="checkbox"/> Building Evacuated <input type="checkbox"/>
<u><b>Incident Cause</b></u>		
Dig In <input type="checkbox"/>	Fire/Explosion <input type="checkbox"/>	Construction Defect <input type="checkbox"/>
UNKNOWN - MORE INFORMATION TO FOLLOW <input type="checkbox"/>	Material Failure <input type="checkbox"/>	Corrosion <input type="checkbox"/>
	Vehicle Impact <input type="checkbox"/>	Suicide <input type="checkbox"/>
Other (describe) _____		
<u><b>Escaping Gas Involvement</b></u> (check all that apply)		
Leak Only <input type="checkbox"/> Fire <input type="checkbox"/> Explosion <input type="checkbox"/> None <input type="checkbox"/>		
<u><b>Summary</b></u> (Briefly describe the incident and the probable cause.)   		
<u><b>Gas Equipment Affected</b></u> (check all that apply)		
Main <input type="checkbox"/>	Regulator <input type="checkbox"/>	Meter <input type="checkbox"/>
Service Line <input type="checkbox"/>	Controls <input type="checkbox"/>	Service Riser <input type="checkbox"/>
Customer Facility <input type="checkbox"/>	Transmission Line <input type="checkbox"/>	Pipe Size _____
Other (describe) _____		MAOP _____
<u><b>Specification of Failed Equipment</b></u>		<u><b>Injuries and Fatalities</b></u>
Material _____		Steel <input type="checkbox"/> Cast Iron <input type="checkbox"/>
Plastic <input type="checkbox"/> Copper <input type="checkbox"/>		None <input type="checkbox"/>
Other <input type="checkbox"/> _____		Injuries _____ Fatalities _____
Operating Pressure _____		Company: _____ Other: _____
<u><b>Dig In Information</b></u>		
USA notification required: Yes <input type="checkbox"/> No <input type="checkbox"/>		<u><b>Estimated Damage</b></u>
USA notified: Yes <input type="checkbox"/> No <input type="checkbox"/>		Damage to gas facilities: _____
Facilities properly marked: Yes <input type="checkbox"/> No <input type="checkbox"/>		Other damage involving gas: _____
Name of Excavator: _____		Total: _____
Excavator Contact Person: _____		
Phone: _____		
<u><b>Recovery from Incident</b></u>		
Date _____	Time (24hr) _____	
Co Personnel on Scene _____	Media <input type="checkbox"/>	Police <input type="checkbox"/>
Gas flow stopped _____	Fire <input type="checkbox"/>	Ambulance <input type="checkbox"/>
Service restored _____	Customers out of service _____	
	Customer-hours outage _____	

### Part III: CPUC INVESTIGATION

Is further investigation warranted? Yes <input type="checkbox"/> No <input type="checkbox"/>	Signature of CPUC Engineer _____
Date incident investigated: _____	Field report attached? Yes <input type="checkbox"/> No <input type="checkbox"/> CPUC Inspector: _____

\*The information contained in this report is provided solely for the confidential use of the Commission and its staff and is not open to public inspection (PUC GO 66-C, Public Utilities Code, Sections 315 and 583).