



Issuing Department: V.P. GAS AND ELECTRIC TRANSMISSION  
 Officer: W. R. MAZOTTI

Effective Date: 1 August 1998  
 Review Date: 1 August 2000

**SUBJECT: Inspection of Underground Gas Holders**

<b>Objective</b>	This California Gas Transmission Standard establishes the requirements for inspection of high pressure underground gas holders.																		
<b>Scope</b>	These requirements apply to bottle-type high pressure underground gas holders. These requirements do not apply to underground gas storage fields or transmission pipeline utilized in pack and drafting of gas.																		
<b>Rescission</b>	This California Gas Transmission Standard supersedes CGT Standard S 4411, revision 1, dated 8/1/96.																		
<b>Related Policy</b>	CPUC General Order 112-E, Subpart E, "Gas Holders."																		
<b>Originator</b>	Technical Committee 21, Station Equipment																		
<b>Business Risk</b>	Non-compliance with this Standard can lead to unsafe operation of a pipeline system, jeopardizing employee and/or public safety and system reliability. Non-compliance with applicable federal and state regulations may subject PG&E to fines.																		
<b>Responsibility for Implementation</b>	Manager, Gas System Maintenance is responsible for ensuring compliance with this Standard.																		
<b>Contact for Further Information</b>																			
<b>Approvals and Authorizations</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 60%;"></td> <td style="text-align: right;"><b>7/12/98</b></td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td> Manager, Gas System Technical Support</td> <td style="text-align: right;">Date</td> </tr> <tr> <td></td> <td style="text-align: right;"><b>7/06/98</b></td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td> Manager, Gas System Maintenance</td> <td style="text-align: right;">Date</td> </tr> <tr> <td><b>W. R. Mazotti</b></td> <td style="text-align: right;"><b>7/17/98</b></td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>W. R. Mazotti, Vice President, Gas and Electric Transmission</td> <td style="text-align: right;">Date</td> </tr> </table>		<b>7/12/98</b>	<hr/>		Manager, Gas System Technical Support	Date		<b>7/06/98</b>	<hr/>		Manager, Gas System Maintenance	Date	<b>W. R. Mazotti</b>	<b>7/17/98</b>	<hr/>		W. R. Mazotti, Vice President, Gas and Electric Transmission	Date
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**Requirements**

Inspections of high pressure gas storage facilities are to be made in accordance with the provisions of California Public Utilities Commission (CPUC) General Order 112-E, and this California Gas Transmission (CGT) Standard.

The three types of inspections required for a high pressure underground gas holders are as follows:

**Monthly Inspections**

1. A monthly inspection shall be performed by the Gas System Maintenance Department or its delegated contractor.

Inspection results shall be recorded on the Monthly Gas Holder Inspection Form (Form F4411-1).

The original Inspection Report shall be retained in the files of the group performing the inspections and one copy forwarded to the Local Transmission Superintendent in the Gas System Maintenance Department for review. After review, the copy shall be forwarded to the Records Section of the Gas System Technical Support (GSTS) Department for filing. The Monthly Inspection Reports shall be retained for at least three years.

**Annual**

2. Annual inspections shall be performed by the Gas System Maintenance Department or its delegated contractor.

Inspection results shall be recorded on the Annual Gas Holder Inspection Form (Form F4411-2).

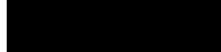
The original Inspection Report shall be retained in the files of the group performing the inspections and one copy forwarded to the Local Transmission Superintendent in the Gas System Maintenance Department for review. After review, the copy shall be forwarded to the Records Section of GSTS for filing. The Annual Inspection Reports shall be retained for at least three years.

**Ten-Year**

3. Inspections shall be performed on high pressure holders every ten years with the results recorded on the Ten-Year Gas Holder Inspection Form (Form F4411-3).

Ten-Year inspections shall be performed by independent licensed contractors, who are selected by the Gas System Maintenance Department and are agreeable to the CPUC as per GO-112E. The Gas System Maintenance Department shall forward the name of the selected contractor and the proposed inspection date to the Technical Services Department in DCS who will contact the CPUC. A CPUC representative may elect to witness the inspection.

Inspection results shall be recorded by the independent inspector and retained by the group responsible for maintenance. One copy of the report shall be sent to the Technical Services Department for forwarding to the CPUC and one copy to the Local Transmission Superintendent in the Gas System Maintenance Department for review. After review the copy shall be forwarded to the Records Section of GSTS for filing. The Ten-Year Inspection Report shall be



**Responsibilities**

kept for the life of the facility.

Responsibility for the Monthly, Annual, and Ten-Year inspection of holders, the preparation of necessary records, and routine, emergency, and scheduled maintenance are as follows:

- a) The Gas System Maintenance Northern Area Superintendent (or designate) shall be responsible for the inspection of the North Sacramento and Yuba City Underground Holders
- b) The Gas System Maintenance Southern Area Superintendent (or designate) shall be responsible for the inspection of the Santa Cruz Underground Holder.

Duties of the Gas System Maintenance Department associated with all holder inspection and maintenance shall include: Issuing special instructions, training, reviewing and maintaining annual and additional inspection records, and initiating action to correct conditions requiring immediate or scheduled attention.

**Forms**

Gas Holder Inspection Forms appear in the Exhibits to this Standard.

- 1. Exhibit A: Monthly Underground Gas Holder Inspection (Form F4411-1)
- 2. Exhibit B: Annual Underground Gas Holder Inspection (Form F4411-2)
- 3. Exhibit C: Ten-Year Underground Gas Holder Inspection (Form F4411-3)



**PACIFIC GAS & ELECTRIC COMPANY**  
**MONTHLY UNDERGROUND (GAS) HOLDER INSPECTION**

Location: \_\_\_\_\_ Underground Holder                      Month \_\_\_\_ Year \_\_\_\_

***INSPECTOR'S NOTE: When space provided below is not enough, use reverse side of this form.***

MONTHLY	CONDITION IN WHICH FOUND / RESULTS	CONDITION IN WHICH LEFT
1. Check all motor-operated valves for lubricant.		
2. Is relief device shutoff valve (if any) locked open?		
3. Inspect relief devices for leaks.		
4. Inspect regulators for proper operation.		
5. Holder Pressure Gauge Check - Pressure Readings using: a. Holder Recording Gauge. b. Test Gauge.		
6. Record Dew Point readings (lb/MMcf) of gas sampled from holder.(See note below)		
7. Hours spent on above inspection.		

Note: Dewpoint readings should be less than 20 lb/MMscf. (The maximum dewpoint reading is based on 500 psig operating pressure and 45 deg. F. ground temp.)

**Summarize operating condition of the station. Indicate any changes or improvements that are advisable.**

Signed \_\_\_\_\_

Date \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**PACIFIC GAS & ELECTRIC COMPANY**  
**ANNUAL UNDERGROUND (GAS) HOLDER INSPECTION**

Location: \_\_\_\_\_ Underground Holder

Year of Inspection: \_\_\_\_\_

***INSPECTOR'S NOTE: When space provided below is not ample, use reverse side of this form.***

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1. Is the holder yard entirely fenced? Are fence and gates in good condition?
  
2. Is the yard relatively free from trash, papers, and other combustible? Are weeds maintained to a manageable level so as not to create an extreme fire hazard?
  
3. Is there any flammable building(s) within 75 feet of the holder?
  
4. Record any locations at which corrosion is apparent.
  
5. Record the condition of paint on exposed piping and fittings.
  
6. Give the approximate magnitude and location of any leaks found in exposed manholes, connections, and fittings on holder as result of soapsuds test or combustible gas indicator.



7. Inspect all valves for freedom of operation. Note condition of valves.
8. Give results of operating tests on relief equipment.
9. Give a description and typical analysis of the gas or gases stored in the holder during the past year.
10. Record Dew Point readings of gas sampled from holder. Dewpoint readings should be less than 20 lb/MMscf. (The maximum dewpoint reading is based on 500 psig operating pressure and 45 deg. F. ground temp.)
11. Are all fire protection devices located at their designated stations and deemed to be in good working order?
12. Is there a placard in a conspicuous place which identifies the maximum safe working pressure of the holder?
13. Summarize the general condition of the holder and indicate any changes, repairs, or improvements that should be made.

Inspected by \_\_\_\_\_

Position \_\_\_\_\_

Date \_\_\_\_\_



**PACIFIC GAS & ELECTRIC COMPANY**  
**TEN-YEAR UNDERGROUND (GAS) HOLDER INSPECTION**

Location: \_\_\_\_\_ Underground Holder Year of Inspection: \_\_\_\_\_

Date of Last 10-Year Inspection Accepted by CPUC: \_\_\_\_\_

Previous Inspection Made By: \_\_\_\_\_

PHYSICAL DATA

Group 1) Bank Nos.: \_\_\_\_\_ Pipe Diameter: \_\_\_\_\_

Total Pipe Length: \_\_\_\_\_ Installation Date: \_\_\_\_\_

Wall Thickness Pipe: \_\_\_\_\_ End Cap: \_\_\_\_\_

Group 2) Bank Nos.: \_\_\_\_\_ Pipe Diameter: \_\_\_\_\_

Total Pipe Length: \_\_\_\_\_ Installation Date: \_\_\_\_\_

Wall Thickness Pipe: \_\_\_\_\_ End Cap: \_\_\_\_\_

Group 3) Bank Nos.: \_\_\_\_\_ Pipe Diameter: \_\_\_\_\_

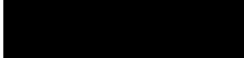
Total Pipe Length: \_\_\_\_\_ Installation Date: \_\_\_\_\_

Wall Thickness Pipe: \_\_\_\_\_ End Cap: \_\_\_\_\_

End Cap Type: Semi-Elliptical Type of Joints: Butt Welded

Internal Vol. (cubic foot): \_\_\_\_\_ Working Pressure: \_\_\_\_\_

NOTE: The Ten-Year inspection shall be performed by an independent licensed contractor who are agreeable to the CPUC as per GO-112E. The inspector shall prepare a report based on the information listed on this form.



**TEN-YEAR UNDERGROUND (GAS) HOLDER INSPECTION (Cont'd)**

**EXTERNAL INSPECTIONS**

1. Record locations at which corrosion is apparent.
2. Record condition of paint on exposed piping and fittings.
3. Is holder yard entirely fenced? Are fence and gates in good condition?
4. Is there any flammable building(s) within 75 feet of the holder?
5. Is the yard relatively free from trash, papers, and other combustible material? Are weeds maintained to a manageable level so as not to create a fire extreme hazard?
6. Give approximate magnitude and location of any leaks found in exposed manholes, connections, and fittings on holder as result of soapsuds test.
7. Give results of operating tests on relief equipment.
8. Describe fully the location and extent of any corrosion and leaks that were found resulting from soil interaction.
9. Describe the conditions of any protective coating used to prevent soil corrosion and state if it should be repaired or replaced.





**TEN-YEAR UNDERGROUND (GAS) HOLDER INSPECTION (Cont'd)**

**INTERNAL INSPECTION**

ULTRASONIC INSPECTION

Note: An ultrasonic inspection can be performed in lieu of an internal visual inspections as stipulated by paragraph 183.4 of G.O. 112-E.

As a minimum, the following information must be on the report.

1. Name of independent licensed contractor, and name of company.
2. Describe the ultrasonic test instrument used.
3. Describe which cylinders and the locations on the cylinder where the ultrasonic readings were taken.  
A minimum of twenty percent of the bottles of same diameter and vintage must be examined at two locations.
  - A. Along the one section of cylinder at eight points circumferentially around the cylinder.
  - B. At one end cap.
4. Describe which cylinders were ultrasonically inspected during the previous Ten-Year Inspection. (Current Ten-Year Inspection shall not inspect the same cylinders.)
5. Give description of the typical analysis of the gas or gases stored in the holder.



**TEN-YEAR UNDERGROUND (GAS) HOLDER INSPECTION (Cont'd)**

**GENERAL**

1. Is the holder or any of the equipment adjacent thereto in a hazardous condition?
  
2. If the holder is the only one of a group inspected, does its condition indicate that others in the group should be inspected at this time?
  
3. If the holder is the only one of a group inspected, as a result of this inspection can it be reasonably assumed that all others in the group are in safe working condition?
  
4. Summarize general condition of holder and indicate any changes, repairs, or improvements that should be made.

