

*Memorandum*

Date: July 22, 1996 File #: 462  
To: VARIOUS  
From: VICE PRESIDENT - GAS SERVICES & OPERATIONS  
Subject: GS Standard No. S 4411  
Inspection of Underground Gas Holders



GAS SUPPLY MANAGERS:

Attached for your use is Gas Supply (GS) Standard No. S 4411 which specifies the requirements for inspection of underground gas holders. This revision eliminates inspection of low pressure holders and liquid hydrocarbon vessels, updates inspection requirements to reflect changes in GO 112-E, and clarifies inspection forms. Its effective date is August 1, 1996.

GS Standard No. S 4411 supersedes Standard Practice 453-1.

If you have any questions, please contact Susan Chwistek of the Gas System Standards Management Section on Ext. 223-8108.

  
WILLIAM R. MAZOTTI

RTArita (3-3279)

cc: Jack F. Jenkins-Stark



Robert G. Gross



Eric G. Kirkpatrick

Merek E. Lipson



Attachment



Issuing Department: GAS SYSTEM TECHNICAL SUPPORT

Effective Date: 8/1/96

Gas Supply Officer: VP - GAS SERVICES & OPERATIONS

Review Date: 8/1/98

<b>SUBJECT:</b> <p style="text-align: center;">INSPECTION OF UNDERGROUND GAS HOLDERS</p>
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## 1.0 SCOPE

- 1.1 This Gas Supply Standard covers inspection requirements of high pressure underground gas holders.
- 1.2 This Gas Supply Standard supersedes SP 453-1, dated 9/1/82.

## 2.0 REQUIREMENTS

- 2.1 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 Gas Supply (GS) Standard established by the Gas System Maintenance and Gas System Technical Support (GSTS) Departments of Gas Supply.
- 2.2 The three types of inspections required for a high pressure underground gas holders are as follows:

### 2.2.1 Monthly Inspections

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 (Supplement A).

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

### 2.2.2 Annual

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 (Supplement B).

The original Inspection Report shall be retained in the files of the group performing the inspections and one copy forwarded to the Senior Transmission Engineer 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.



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**INSPECTION OF UNDERGROUND GAS HOLDERS**

**2.2.3 Ten-Year**

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

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 Gas Distribution Department 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 Gas Distribution for forwarding to the CPUC and one copy to the Senior Transmission Engineer in the Gas System Maintenance Department for review. After review the copy shall be forwarded to Records Section of GSTS for filing. The Ten-Year Inspection Report shall be kept for the life of the facility.

**3.0 RESPONSIBILITY**

3.1 Responsibility for the Monthly, Annual, and Ten-Year inspection of holders, the preparation of necessary records, and routine, emergency, and scheduled maintenance shall rest with the Manager of Gas System Maintenance as follows:

3.1.1 The Northern Gas Operations Superintendent or his/her designate shall be responsible for the inspection of the North Sacramento and Yuba City Underground Holders

3.1.2 The Southern Gas Operations Superintendent or his/her designate shall be responsible for the inspection of the Santa Cruz Underground Holder.

3.2 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.

**4.0 REFERENCES**

4.1 The CPUC General Order 112-E, "Rules Governing the Design, Construction, Testing, Maintenance, and Operation of Utility Gas Gathering, Transmission, and Distribution Piping Systems."



**SUBJECT:**

INSPECTION OF UNDERGROUND GAS HOLDERS

**5.0 SUPPLEMENTS**

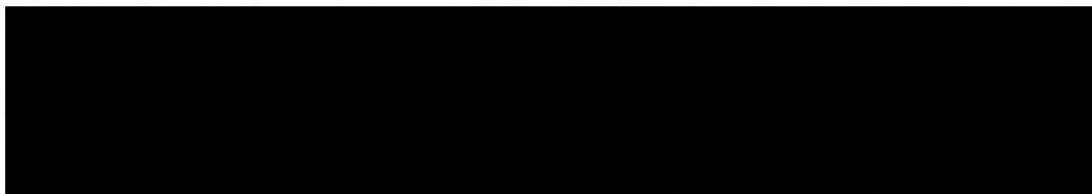
Gas Holder Inspection Forms appear in the Supplements to this Standard.

1. Supplement A: Monthly Underground Gas Holder Inspection
2. Supplement B: Annual Underground Gas Holder Inspection
3. Supplement C: 10-Year Underground Gas Holder Inspection

**6.0 FOR FURTHER INFORMATION**

For further information contact Gas System Standards Management Section of Gas System Technical Support.

**APPROVED BY:**



Manager, Gas System Maintenance

Manager, Gas System Technical Support

**AUTHORIZED BY:**

WILLIAM R. MAZOTTI

Vice President - Gas Services & Operations

**DISTRIBUTION:** Central Coast Division Manager  
Sacramento Division Manager  
Sierra Division Manager  
Northern Area Superintendent  
Southern Area Superintendent  
Directors, Gas System Maintenance  
Director, Gas Distribution

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**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/mm scf. (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 \_\_\_\_\_

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**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.

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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/mm scf. (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 \_\_\_\_\_

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**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.

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**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.

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**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.

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**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.

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