



Asset Type: **Gas**

Date Issued/Updated: **December 2008**

Function: **Operations and Maintenance**

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Title: Patrolling Pipelines, Stations, and Mains

Overview

This work procedure establishes a uniform procedure for patrolling Pacific Gas and Electric Company (Company) gas facilities.

Patrolling Company gas facilities is the responsibility of the operating department supervisor and the district superintendent who direct the maintenance and operation of these facilities in their areas.

Performance responsibilities include the following tasks:

1. Determining the specific scope of patrols and any special considerations.
2. Scheduling and assigning patrol frequency.
3. Reviewing and maintaining patrol records.
4. Initiating and ensuring the completion of actions to correct conditions found during patrols.

Maintaining patrol records is the responsibility of the division Maintenance and Construction (M&C) department and the gas transmission district offices.

Governing Document

[Utility Standard S4412, "Protection of Underground PG&E Gas, Electric, and Fiber Optic Cable Facilities"](#)

Safety

Performing the patrols defined in this work procedure promotes public safety by reducing potential hazards from surface conditions that could lead to gas facility failure or leakage.

Detailed Procedure for Patrolling Pipelines, Stations, and Mains

1. Facilities to Be Patrolled

Patrol the following facilities

- A All gas gathering lines
- B All gas transmission lines
- C Any gas distribution lines and distribution feeder mains (DFMs) operating at $\leq 20\%$ specified minimum yield strength (SMYS) in places or on structures where anticipated physical movement or external loading could cause leakage or failure
- D Exposed distribution mains and services, excluding gas service risers not covered by item C, above
- E Major gas facilities
- F Any other gas pipeline facilities requiring special attention, as conditions warrant

2. Conditions to Observe and Report

Observe and report the following conditions

- A Landslides or threatened slides
- B Erosion by streams, wave action, rain, or other natural causes
- C Land subsidence, earth slippage, or extensive tree root growth that could affect the pipeline, main, or service
- D Possible third-party threats, including construction or maintenance work along the pipeline (within 220 yards [660 feet] on either side) or encroachments on the Company's right-of-way
Observe any excavation, grading, demolition, or other construction activity which could result in
 - 1 Damage to the pipe
 - 2 Loss of support because of settlement or shifting of soil around the pipe
 - 3 Undermining or damage to pipe supports
 - 4 Loss of cover
 - 5 Excess fill
- E Presence of survey parties and/or other indications of possible future work within 220 yards (660 feet) on either side of the pipeline
- F Evidence of gas leakage, as indicated by dead or dying vegetation, bubbles in surface water, odor, readings, etc
- G Signs of severe seismic displacement (fault zones)
- H Damage to Company-owned facilities, including casing vents

- I Damage to the supports for exposed pipe for both transmission and distribution pipe. Damage includes but is not limited to corrosion, missing supports, cracked supports, and loose supports. Supports include highway structures and other facilities not owned by the Company that provide support to company facilities.
- J Evidence of atmospheric corrosion on above-ground piping or at air-to-soil transition zones.
- K Access roads that may not be in a passable condition.
- L Pipeline markers and signage, including those inside Company-owned stations.
- M Any other factors affecting the operation or safety of the pipeline.

3. Patrolling Methods

Perform all patrols either by aerial observation or by ground observation.

A Aerial Observation

- 1 Coordinate routine aerial patrols of gas transmission lines with the designated Company Aerial Pipeline Patrol Program Manager.
- 2 Coordinate other special aerial patrols (e.g., helicopter patrols) with the Gas Transmission and Distribution (T&D) Technical Specialist Program Manager.
- 3 Supplement aerial patrols with ground patrols whenever any of the conditions listed in Section 2, "Conditions to Observe and Report," cannot be adequately observed by aerial patrol.

B Ground Observation

Perform ground patrols in conjunction with other work as long as the necessary functions of patrolling, including reporting, are accomplished.

4. Annual Reviews of Facilities to be Patrolled

- A Local offices review and update, as required, the list of pipelines to be patrolled.
- B Local offices review and update, as required, the patrolling methods for each pipeline.
- C The Aerial Pipeline Patrol Program Manager reviews and updates, as required, the Aerial Patrol Program.

5. Frequency

Table 1 summarizes the minimum frequencies required for patrolling. Patrol more frequently as local conditions warrant. Conditions to consider include but are not limited to:

- A Earthquakes
- B Landslides
- C Fires
- D Heavy rainstorms or extended rainfall
- E Train derailments near a pipeline right-of-way
- F Other disasters

Table 1 Minimum Patrol Frequencies

Facilities	Quarterly (Note 1)	Semiannually	Annually	Acceptable Methods
All Gas Transmission Lines Gathering Lines, and Major Gas Facilities	X (Note 4)			Aerial and/or ground (Notes 2 and 3)
All Distribution Lines in places or on structures where anticipated physical movement or external loading could cause failure or leakage and consequent hazards to public safety				Aerial and/or ground (Notes 2 and 3)
A In business districts	X			
B Outside business districts		X		
Exposed Distribution Lines not covered by the above			X	Ground

Notes

- 1 The section, "Definition of Terms" defines patrol frequencies
- 2 Aerial patrol is preferred for most of the transmission lines >20% SMYS. Patrol by ground if it is not practical to patrol by air (e.g., due to heavy foliage over a pipeline, air space restrictions, etc.)
- 3 If the conditions listed in Section 2, "Conditions to Observe and Report," cannot be adequately observed by aerial patrol, supplement the aerial patrol with ground patrol.
- 4 Employees may request a variance to allow semiannual ground patrols for transmission lines in Class 1 and 2 areas in which aerial patrol is not possible. Contact the Gas Engineering Regulatory Support and Analysis group to request a variance.

6. Corrective Actions

When possible during the patrol, take corrective actions to address conditions found

For conditions that require immediate attention and cannot be corrected during the patrol, contact the responsible supervisor or superintendent as soon as possible to have the condition addressed

Corrective actions for conditions that require follow-up attention that can be deferred must be completed before the next patrol and no later than the end of the year following the year of discovery (e.g., conditions found in year one must be addressed no later than the end of year two)

Note: The reviewing supervisor must concur with the recommended corrective actions

7. Documentation**A Form Completion and Submission**

Document all patrols with the appropriate forms specified in this section

1 All Patrols**a Complete the Pipeline Patrol Report (F4412-07-1)**

Note: The person performing the patrol must fully complete the form and clearly print the patroller's LAN ID and the date of the patrol, then initial the form in the space provided. Submit the form to the responsible supervisor.

The supervisor responsible for reviewing the Pipeline Patrol Report must also clearly print the reviewer's local area network identification (LAN ID) and the date of review, then initial the form in the space provided

b Complete a Corrective Notification to report any conditions found during the patrol that require immediate attention but cannot be corrected by the patrol. Submit the Corrective Notification to the responsible supervisor or superintendent**2 Aerial Patrols****a The Aerial Pipeline Patrol Program Manager, who administers the Aerial Patrol Program, customizes an "Aerial Patrol Report" for the pipeline segments patrolled in each area****b The pilot completes the customized "Aerial Patrol Report" to document each aerial patrol****c Send the completed "Aerial Patrol Report" to the district or division offices for the pipeline segments and/or DFMs patrolled****d Each office that receives aerial patrol reports has an Aerial Patrol Binder that contains pertinent aerial patrol information and the aerial patrol reports filed by pilots****e The Aerial Pipeline Patrol Program Manager also retains copies of the Aerial Patrol Reports. Local offices can call the Aerial Pipeline Patrol Program Manager to request additional copies of aerial patrol reports**

3. Ground Patrols

Complete the "Pipeline Patrol Report" (F4412-07-1) to document ground patrols.

4. Special Inspections

a. Spans

Complete the "Exposed Pipelines and Spans" form (F4412-07-2) to document inspection of exposed piping and spans.

b. Landslides

Patrol slide conditions quarterly, at a minimum.

Note: Complete the "Landslide Area" form (F4412-07-3) only if slide conditions exist.

B. Form Retention

Retain all patrol reports and records of Company responses at the district or division M&C local offices.

1. When action is required as a result of the patrol findings, retain the records describing the Company's response for the life of the patrolled facility.
2. When no action is required as a result of the patrol findings, retain all completed patrol reports for the following minimum lengths of time:
 - a. Five years for gas transmission pipelines and facilities.
 - b. Three years for gas distribution facilities.

Definition of Terms

Class Location: The density of buildings as defined in 49 CFR 192.5, "Class Locations."

CFR: Code of Federal Regulations.

CPUC: California Public Utilities Commission.

DFM: Distribution Feeder Main. A line operating over 60 pounds per square inch gauge (PSIG) that is not a numbered transmission line.

Distribution Line: A pipeline that serves as a common source of supply for more than two service lines.

Exposed Facility: A gas line that is normally exposed to the atmosphere. Mains and services on the roofs of buildings are included. Facilities that are exposed in an excavation are not included.

Gathering Line: A pipeline that transports gas from a current production facility to a transmission line or main. This term includes collection lines taking gas from wells.

Major Gas Facilities: Facilities that modulate gas pressure and flow or process the gas within the gas transmission system. These facilities may be unmanned, manned part- or full-time, or remotely operated. Major gas facilities include the following items:

- System control points, such as terminals and gas load centers
- Compressor stations
- Pipeline pressure limiting stations
- Gas processing facilities
- Line rupture control valves (LRCVs)
- Gas metering and regulating facilities serving electric generating plants
- Underground gas storage field facilities
- Other facilities handling large volumes of gas and containing any of the following equipment
 - Controller-operated equipment
 - 10-inch or larger control valves
 - Ultrasonic metering

Patrol Frequencies:

- Quarterly – At least four times each calendar year, not to exceed 4½ months to the date, per 49 CFR Subpart M, section 192.705
- Semiannually – At least twice each calendar year, not to exceed 7½ months to the date
- Annually – At least once each calendar year, not to exceed 15 months to the date

PSIG: Pounds per square inch gauge

SMYS: Specified minimum yield strength

Transmission Lines: All lines operating over 20% SMYS that are not gathering lines. This term includes gas underground storage field injection and withdrawal lines and lines that transport gas within a storage field.

Recision This work procedure cancels and supersedes the following documents:

- Gas Information Bulletin No. 138, "Transmission Patrolling Requirements"
- Utility Standard S4111, "Patrolling Pipelines and Mains"
- Form 62-4648/F4111-A, "Pipeline Patrol Report"
- Form F4111-C, "Exposed Pipelines and Spans Form"
- Form F4111-D, "Landslide Form"

Reference Documents

- 49 CFR 192 Section 605(b), "Procedural Manual for Operations, Maintenance, and Emergencies"
- 49 CFR 192.5, "Class Locations"
- 49 CFR 192.705, "Transmission Lines: Patrolling"
- 49 CFR 192.721, "Distribution Systems: Patrolling"
- CPUC General Order 112E, "State of California Rules Governing Design, Construction, Testing, Operation, and Maintenance of Gas Gathering, Transmission, and Distribution Piping Systems"
- Gas Numbered Document O-16, "Corrosion Control of Gas Facilities"
- Utility Standard S4110, "Leak Survey and Repair of Gas Transmission and Distribution Facilities"
- Utility Standard S4122, "Gas Pipeline Markers" (to be reissued as Gas Numbered Document L-10)
- Utility Standard 4127, "Class Location Determination, Compliance and Maintenance"

Attachments

- Attachment 1, Form F4412-07-1, "Pipeline Patrol Report"
- Attachment 2, Form F4412-07-2, "Exposed Pipelines and Spans"
- Attachment 3, Form F4412-07-3, "Landslide Area"

Contact for More Information


Internal [REDACTED]
External [REDACTED]

Date Issued December 2008

Approved by



Revision History

Chg.No.	Date	Description	By (LAN ID)
00	December 2008	Initiated new document	



Pipeline Patrol Report

Requirement: Complete this form in non-erasable ink

Area		District		Map(s) No		Date	
Pipeline No .		From MP		To MP		Weather.	
GPS Read							
Location of Work Assignment							
Special Equipment Needed							
Leak Survey Method Visual/Vegetation <input type="checkbox"/> Instrument <input type="checkbox"/> Instrument ID.							
Points to Observe and Report						COND OK	SEE COND FOUND
A Landslides or threatened slides						✓	✓
B Erosion by streams, wave action, rain, or other natural causes							
C Land subsidence, earth slippage, or extensive tree root growth that could affect the pipeline, main, or service							
D Possible third-party threats, including construction or maintenance work along the pipeline (within 220 yards [660 feet] on either side), or encroachments on the Company's right-of-way Observe any excavation, grading, demolition, or other construction activity which could result in damage to the pipe, loss of support because of settlement or shifting of soil around the pipe, undermining or damage to pipe supports, loss of cover, or excess fill							
E Presence of survey parties and/or other indications of possible future work within 220 yards (660 feet) on either side of the pipeline) If yes, fill out form F4127, "Report of New Construction "							
F Evidence of gas leakage, as indicated by dead or dying vegetation, bubbles in surface water, odor, readings, etc							
G Signs of severe seismic displacement (fault zones)							
H Damage to Company owned facilities							
I Damage to the supports for exposed pipe for both transmission and distribution pipe Damage includes but is not limited to corrosion, missing supports, cracked supports, and loose supports Supports include highway structures and other facilities not owned by the Company that provide support to company facilities							
J Evidence of atmospheric corrosion on aboveground piping							
K Access roads that may not be in a passable condition							
L Pipeline markers and signage, including those inside Company-owned stations							
M Any other factors affecting the operation or safety of the pipeline							
Locations Instrument Surveyed							
Description		Mile Points		Description		Mile Points	
Performed by (Clearly print Name or LAN ID)		Date		Reviewed By (Clearly print Name or LAN ID)		Date	
Signature				Signature			



Pipeline Patrol Report

Requirement: Complete this form in non-erasable ink.

Conditions Found This Day

Issue	Date	Action	Clearly print LAN ID	Initials	Date



Exposed Piping and Spans

Gas T&D
12-08
F4412-07-2
Page 1 of 2

Requirement: Complete this form in non-erasable ink.

District or Area. _____

Year: _____

Line No.: _____ MP: _____ To MP: _____ GPS Read: _____

Location.

County	Mile Point	Length of Span	Number of Supports	Conditions: OK () or Issues () (For issues, fill out Page 2)								Patrolled By (Clearly print LAN ID)	Initials	Date
				Corrosion		Supports		Paint		Pipeline and Mileage Markers				
				OK	Issue	OK	Issue	OK	Issue	OK	Issue			

Reviewed By: _____
Clearly print name or LAN ID: _____ Signature: _____ Date: _____

Mile Point	Issue	Action	LAN ID (Print clearly)	Initials	Date

Requirement: Complete this form in non-erasable ink.

District or Area. _____

Year: _____

Line No.: _____ MP _____ To MP: _____ GPS Read: _____

Location:

County	Mile Point	Slide Identifier (if available)	Conditions: S = Stable () or E = Engineering Review Required () (For Engineering Review, fill out Page 2)																				
			1 st Patrol			2 nd Patrol			3 rd Patrol			4 th Patrol											
			S	E	Print clearly LAN ID Initial Date	S	E	Print clearly LAN ID Initial Date	S	E	Print clearly LAN ID Initial Date	S	E	Print clearly LAN ID Initial Date									
Print clearly			Reviewed By (LAN ID, Initials)		Date	Reviewed By (LAN ID, Initials)		Date	Reviewed By (LAN ID, Initials)		Date	Reviewed By (LAN ID, Initials)		Date									

Requirement: Complete this form in non-erasable ink.

Mile Point	Patrol Date	Issue	Action	LAN ID (Print clearly)	Initials	Date

[REDACTED]

From: [REDACTED]
Sent: Tuesday, June 30, 2009 6 26 PM
To: [REDACTED] (GT&D)
Cc: [REDACTED]
Subject: Review of 4412-07

[REDACTED]
Here are my review highlights

1. Major stations (transmission) are covered by this WP See definition in document
2. District reg stations and "minor" transmission stations are not covered I have no idea why they aren't Since this is a UO WP, all stations should be covered.
3. Page 3 J includes atm corrosion on above ground piping in scope of document. Above ground is not defined so piping in pits and vaults is at risk for no evaluation
4. Page 3 Frequencies I wonder how 39 months to the date gets interpreted?
- 5 Based on my read, this document definitely needs a separate form for station evaluations of atm corrosion.
6. Note reporting methods in 6.a.1.b I don't think this should preclude the need for the form I identified in 5. above

[REDACTED]

Make your summer sizzle with fast and easy recipes for the grill

7/1/2009

[REDACTED]

From: [REDACTED]
Sent: Wednesday, June 24, 2009 1:26 PM
To: [REDACTED] (GT&D); Roland, George (GT&D)
Cc: [REDACTED] (GT&D); [REDACTED] (GT&D)
Subject: RE: DR Maint Forms

Team,

On the back of these maintenance forms, do we want to add (at the top of the page) something like: "For outstanding or planned corrective actions needed, indicate the SAP Corrective Work Notification Number".

III.F.7 of WP4540-01 already contains a similar note, but do we need/want it on the form?

[REDACTED]

From: [REDACTED] (GT&D)
Sent: Tuesday, June 23, 2009 1:01 PM
To: [REDACTED] (GT&D)
Cc: [REDACTED] (GT&D); [REDACTED] (GT&D)
Subject: DR Maint Forms

[REDACTED]

The updated maintenance forms are attached. These forms take into account the new WP4540-01 Draft #T and comments given at yesterday's meeting.

<< File: WP4540-01 Att1Form62-6321 version #5.doc >> << File: WP4540-01Att2Form62-6321A HPR version #4.doc >>
Thank you,

[REDACTED]