
S.P. 464-2

62-6218 (REV. 10/83)

PG and E

FOR INTRA—COMPANY USES

From Division or Department: GAS MEASUREMENT & REGULATION

To Division or Department:

FILE NO: 464

RE LETTER OF

SUBJECT: S.P. 464-2 District
Regulator Station Maintenance

REGIONAL MANAGERS
MANAGER, PIPE LINE OPERATIONS

The subject Standard Practice has been revised effective August 1, 1986. A copy is attached for your use.

Significant Revisions:

1. Further clarification of anniversary month.

2. Specify that annual maintenance must be performed once each calendar year regardless of the anniversary month.

3. We have restored paragraphs 14, 15, 16 and 17.

4. Clarify requirements for calibration of permanent pressure recorders for Class A and B inspections at regulator stations.

5. Add requirement to pressure check vent line and upper diaphragm of regulator for low pressure regulator stations which are below grade.

6. Make clear that diaphragms on regulators and overpressure protection devices are to be visually examined under a Class B inspection.

7. Change requirement for retention of pressure recording charts from two years to three years.

In addition to the routine distribution of this Standard Practice to the supervisory personnel listed on Page 2 of the Standard Practice, sufficient copies will be sent under separate cover for all Measurement and Control Manuals. Regional Gas Operations Managers have the list of M&C Manual holders.

Personnel responsible for the maintenance of district regulator stations should become familiar with these revisions.

Item Number 5 was added as a result of several low pressure stations that experienced an overpressure condition when water flooded the pit and leaked on top of the diaphragm. Subsequent investigations showed that water seeped through corrosion holes in the vent line or through an imperfect seal on the top diaphragm casing. Applying pressure on top of the diaphragm through the vent line will detect any leaks and thus avert over pressurizing a station from flooding.

[redacted]

[redacted]

Attachment

cc: HMMcKinley
[redacted]
CJTateosian

62-7501 REV. 2/84 Pacific Gas and Electric Company

STANDARD PRACTICE

STANDARD PRACTICE NO 464-2

ISSUING DEPARTMENT GAS MEASUREMENT & REGULATION

PAGE NO 1 (of) 2 EFFECTIVE 8/1/86

CORPORATE OFFICER GAS OPERATIONS

REPLACING PAGE NO 1 (of) 2 EFFECTIVE 9/1/86

SUBJECT

DISTRICT REGULATOR STATION MAINTENANCE

GAS MEASUREMENT AND CONTROL MANUAL SECTION 13

PURPOSE

1. To establish a uniform policy for the inspection, testing, maintenance and associated record keeping of division regulator stations.

POLICY

2. Division regulator stations shall be periodically inspected, tested and maintained.

SCOPE AND DEFINITION

3. Division regulator stations are the pressure control devices and their appurtenances, within the transmission and distribution system, which limit and control pressures to distribution mains that serve 3 or more customers. Pressure regulating stations at customer meters, compressor stations, and at major gas control and pressure regulation centers are excluded from this standard practice.

RECISSIONS

4. All previous letters and instructions in conflict with this standard practice.

REFERENCES

*5. S.P. 460-21.6, Vault Inspection Procedure
S.P. 463-9, Recording Pressures in Distribution Systems
S.P. 570-22, Inspection and Calibration of Test Gages
Gas Standards and Specifications F-11, H-14 and H-70

RESPONSIBILITY

*6. It shall be the responsibility of the supervisors in the Region and Pipe Line Operations, who direct the maintenance and operation of the facilities, to establish and maintain procedures to comply with this standard Practice.

*Paragraph Revised (Portions Underlined)
**Paragraph Added

Pacific Gas and Electric Company

STANDARD PRACTICE

STANDARD PRACTICE NO 464-2

ISSUING DEPARTMENT GAS MEASUREMENT & REGULATION

PAGE NO 2 (of) 2 EFFECTIVE 8/1/86

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GAS MEASUREMENT AND CONTROL MANUAL SECTION 13

APPLICATION

7. Procedural details and supplemental data appear in addenda to this standard practice.

   Supplement - Procedural Details
   Appendix - Division Regulator Station Inspection, Testing and Maintenance Work

ISSUED BY

[redacted]
Manager, Gas Measurement and Regulation

APPROVED BY

Howard M. McKinley

HOWARD M. McKINLEY
Vice President - Gas Operations

DISTRIBUTION

Regional Managers
Regional Gas Operations Managers
Division Managers
Division Gas Superintendents
Manager Pipe Line Operations
Gas Measurement and Control Manual Holders

Additional copies of this standard practice may be obtained from Gas Operations, 77 Beale Street, San Francisco (Extension 1604).

*Paragraph Revised (Portions Underlined)
**Paragraph Added

PROCEDURAL DETAILS FOR INSPECTION, TESTING AND MAINTENANCE OF DIVISION REGULATOR STATIONS

GAS MEASUREMENT AND CONTROL MANUAL SECTION 13

INSPECTION SCHEDULES

SCHEDULES

8. Division regulator stations shall be inspected according to the following schedules:

   a) HPR type division regulator stations:

      1) Class A Inspection at least once each calendar year if serving three or more customers.

      2) The inspection schedule for HPR sets serving less than three customers is not covered by this standard practice.

   b) All other division regulator stations:

      1) Class A Inspection at least once each calendar year.

      2) Class B Inspection at least once every two calendar years; however, internal inspection of expansible tube valves may be extended to once each four calendar years at stations where experience justifies such extension.

   *c) An annual "anniversary month" shall be established for the inspection and maintenance of each regulator station covered by Paragraphs 8(a), 8(b), and 13. The "anniversary month" is the calendar month in which the inspection and maintenance is scheduled. Except as permitted by Paragraph 8(e), the "anniversary month" shall be the month in effect as of the date of the revision of this standard practice, and shall be the same month each subsequent year.

   *d) The inspection and maintenance required by Paragraphs 8(a), 8(b), and 13 shall be scheduled for the anniversary month. If circumstances do not permit performance of the work during the month in which it is scheduled, it may be performed in the month prior to or following the scheduled month, but not less than once each calendar year.

   e) A new anniversary month for scheduled maintenance may be established by performing the required inspection and maintenance during a month which is earlier than the anniversary month. A new anniversary month may not be established by performing the scheduled maintenance during a month following the established anniversary month.

   These schedules establish minimum maintenance requirements and maximum time intervals. When conditions require more frequent inspections, a shorter interval shall be established by the supervisor. Where practicable, inspections shall be scheduled to coincide with other work to be performed. The various steps of test, inspection, and maintenance shall be combined when possible.

*Paragraph Revised
**Paragraph Added

INSPECTION SCHEDULES (Continued) SCHEDULES

All Division regulator stations shall be entered in the Facility Maintenance master file (GASFM REVIEW LIST), showing the maintenance to be performed and the established intervals. It is necessary to enter maintenance activities as performed to ensure up-to-date GASFM output schedules.

INSPECTION PROCEDURES PROCEDURES

9. Prior to entering any pit or vault, observe the necessary precautions regarding barricading, sources of ignition, and checking for combustible gases, in accordance with applicable PGandE accident prevention rules.

   Inspection procedures are divided into two categories designated "External" (Class A) and "Internal" (Class B). The work to be performed under each classification is listed in the Appendix. Class A inspections can usually be performed with the set in service. Class B inspections will require taking the unit out of service and disassembly of its component parts to allow inspection. Performance of Class B inspections will include a complete Class A inspection.

   If only a partial inspection is made, the work performed at that time need not be repeated at the next scheduled inspection. However, the maximum interval between complete inspections shall not exceed those prescribed by Paragraph 8.

10. The inspection, testing and preventive maintenance work described in Paragraph 8 is detailed in the Appendix with corresponding letter-number designations on Form No. 62-6321, "Division Regulator Station Maintenance Record."

11. At any stage of inspection, steps shall be taken to correct deviations from proper operation. A division regulator station is considered operating properly when:

    a) the regulator is controlling the set pressure in a stable manner throughout the normal range of flows and normal inlet pressure variations;

    b) all components are adequate from the standpoint of reliability, capacity, and safety; and

    c) all station equipment is free of leakage, in good mechanical condition, and capable of being operated by authorized persons at any time.

    If acceptable operation as described above is not obtained, the problem shall be determined and immediately corrected. Retesting shall be done to ensure that proper operation has been achieved.

*Paragraph Revised
**Paragraph Added

INSPECTION PROCEDURES (Continued) PROCEDURES

12. Regulator station housekeeping, which includes freedom from debris, weeds, water (either in pits or yards), condition of paint (on mechanical piping and structures), security of fencing, vaults and enclosures shall all be maintained as required for good operating practice.

PRESSURE RELIEF AND PRESSURE LIMITING EQUIPMENT PRESSURE RELIEF AND LIMITING EQUIPMENT

13. a) Each pressure relief or limiting device or related group of such devices must be checked for adequate overpressure capability in compliance with Section 192.201 of CPUC General Order 112D, and Paragraph 13(c) below. Adequate overpressure confirmation must be made at least once each calendar year in accordance with schedules established under paragraphs 8(c), 8(d), and 8(e).

Overpressure confirmation is achieved by checking for proper operating settings of monitor regulators, automatic shutoffs and reliefs. The adequacy of relief valves must also be confirmed by either:

1) Physically testing for capacity to limit pressure to the required level, or

2) Making an office review and calculation to verify that under operating conditions, the relief valve has the proper setting and capacity to limit pressure to the required level.

b) Such a review shall also be made when equipment changes or load or pressure conditions alter the capacity of the regulator or the capability of the relief valve to limit pressure buildup.

c) Relieving capacity installed in conjunction with parallel regulators shall be adequate for:

1) A simultaneous "fail open" condition of both the working and standby regulator runs for stations constructed or reconstructed after July 1972.

2) A "fail open" condition of the regulator run with the largest capacity for stations constructed prior to August 1972.

d) Whenever physical tests and/or calculations indicate that relief capacity is inadequate, immediate action will be taken to ensure the installation of equipment adequate to provide the necessary protection against overpressuring.

*Paragraph Revised
**Paragraph Added

RECORDS

RECORDS

**14. A "Division Regulator Station Data Sheet," Form 62-6271, shall be prepared for each division regulator station and filed in the division operating office. Station numbers shall be assigned and a data sheet prepared to cover each stage of regulation.

**15. A record of division regulator inspection and maintenance shall be prepared and filed in the division operating office, using "Division Regulator Station Maintenance Record," Form 62-6321. Where a relief valve is used for overpressure protection, a record shall be maintained of the annual capacity check of these facilities required by G.O. 112D, Section 192.743. A continuous maintenance record shall be retained for 5 years or for the life of the facility, whichever is less.

**16. Pressure recording charts used in division regulator pressure tests shall be filed in the division operating office and retained for a minimum period of three years.

TEST SCHEDULE AND CONTROL

SCHEDULE AND CONTROL

**17. Supervisors shall schedule the inspection and maintenance of division regulator stations as required to comply with this standard practice.

ATTACHMENTS

Appendix - Division Regulator Station Inspection, Testing and Maintenance Work.

*Paragraph Revised
**Paragraph Added

DISTRICT REGULATOR STATION INSPECTION, TESTING AND MAINTENANCE WORK

GAS MEASUREMENT AND CONTROL MANUAL SECTION 13

CLASS A INSPECTION - EXTERNAL

CLASS A INSPECTION

1. Pressure Checks

*a) This paragraph applys to stations with a permanent pressure recorder. Include a two point check (zero and operating pressure) with a test gage (1/4% accuracy) in conjunction with each Class A inspection. Include a three point check with a test gage (zero, operating pressure and upper range) in conjunction with each Class B inspection. The chart must be properly identified as to test gage used, pressure readings, location, date, reason for test and special comments as required. Chart must be initialled by person performing the test.

b) Make a filter differential pressure test with an indicating gage or manometer at the inlet and outlet. If the differential exceeds the maximum or minimum pressures normal to the installation, inspect the filter elements.

2. Make Visual Inspection to Determine:

a) Vault covers open and close properly and are not a hazard to the general public or to PGandE personnel.

b) Ground level around vault provides adequate drainage and is not a hazard to the general public or to PGandE personnel.

c) Presence of gas in vault, using combustible indicator. Test fittings and connections for leakage, using combustible gas indicator or liquid soap.

d) Ventilating ducts and gratings are clear and operating. Relief stacks are clear.

e) Vault structure, ladders, hooks and related equipment are in good mechanical condition.

f) Piping and related equipment including regulators and overpressure protection devices are in good mechanical condition and diaphragm vents are clear.

g) Filter closures are in good mechanical condition.

h) Locking devices are present and operate properly.

3. Operating Tests

a) Check pressure settings and test working and standby regulator or control valve for lockup or ability to control minimum flow.

*Paragraph Revised
**Paragraph Added

b) Test overpressure protection devices:

1) Cause monitor regulators or control valves to operate and take over pressure control at set point.

2) Test mechanical relief valve for ability to operate at overpressure set point.

3) Test automatic shutoff for ability to operate at over and under pressure set points.

4) Verify proper level of sealant in liquid seal reliefs.

4. Valves

Check and operate all regulator station valves and valves required to isolate station in an emergency. (Refer to Gas Standard and Specifications F-11 for maintenance schedules.)

If required, lubricate:

a) Bypass valves.

b) Isolating valves including valve upstream from pit or vault.

c) Regulating valves.

CLASS B INSPECTION - INTERNAL

CLASS B INSPECTION

1. Pilot Regulators

a) Inspect pilot regulator filters, strainers, and dehydrators; clean or replace screens, elements, or filters.

b) Test pilot regulators for mechanical operation:

Proper rangeability, freedom and movement of linkage, and condition of diaphragm.

c) Inspect pilot valve and seat for scoring or wear.

*Paragraph Revised
**Paragraph Added

2. Control and Vent Lines

*a) Disconnect and clear loading, supply, static, vent and gage lines.

**1) Pressure test the vent lines and upper diaphragm for leaks on low pressure regulator stations that are below grade. The pressure test can be done with an air, nitrogen or natural gas medium at 1 to 2 psi held for several minutes. Confirm integrity of components by soap testing or with a pressure gage.

b) Remove restricting orifices and filters and examine or test for obstructions or foreign matter.

3. Main Components

*The paragraphs that follow prescribe maintenance requirements for main regulators, standby regulators, monitors and relief valves as applicable. Automatic shutoffs need not be disassembled unless they do not maintain consistent shut off pressures.

a) Expansible Tube Valves

Disconnect body and remove core and tube. Inspect core and tube for evidence of abrasion, erosion, penetration, or delamination. Disassemble further as necessary if there is evidence of trapped foreign material.

b) Plug or Ball Type Valve Assembly

Refer to Gas Standard F-11 and manufacturer's recommendation for lubrication guidance.

*c) Cage Type Valve Assembly

Remove cage type assemblies (included in this category are standard flat disc and orifice assemblies) and examine disc, o-rings and seats for wear or misalignment.

d) Linkage

Disassemble sufficiently to inspect condition of linkage. Manually manipulate linkage to determine excessive wear, friction, or resistence to motion at packing glands, o-rings, bearings, and bushings. Examine cams, shafts, stems, levers, and bearings for wear and scoring.

*Paragraph Revised
**Paragraph Added

e) Diaphragm and Chamber

Inspect diaphragm assembly for leakage, by applying gas pressure not exceeding normal diaphragm operating pressures, through the static or pilot connections. Use an indicating gage to detect test pressure loss.

1) If pressure loss occurs, soap test bolt circle flange before disassembling diaphragm head to complete inspection.

2) Visually examine diaphragms for pliability, abrasion, rupture, or separation. Replace leather with synthetic diaphragms.

4. Equipment Position

At the completion of every inspection, make certain that all valves and equipment are returned to the normal operating position.

*Paragraph Revised
**Paragraph Added

PG&E
Gas Operations
62 6271 (Rev. 4/82)

DISTRICT REGULATOR DATA SHEET

Gas FM Station No. _____ Nos. of Associated Stations _____

Division _____ District _____

Location _____ Wall Map _____ Grid Sheet _____

Inspection Schedule *(Circle months)*: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Function *(Circle one)*: 1st STAGE 2nd STAGE 3rd STAGE MONITOR

Job No. References _____

Installation Date _____ Date of Last Major Alteration _____

PRESSURE and LOAD INFORMATION

Inlet Press.: MAOP_____ Norm_____ Outlet Press.: MAOP_____ Norm_____ Load Mcf/Hr.: Max._____ Min._____

REGULATORS

		REDUCING		MONITORING		RELIEF VALVE or AUTOMATIC SHUTOFF
		Working	Standby	Working	Standby	
MANUFACTURER.						
Serial No.						
Size, Model & Type						
Inlet Press. Rating						
Head (Diaghragm) Size						
[redacted] Size & Type						
[redacted] Seat Mat'l & Hardness						
Weight Loaded	Range					
	Internal/External					
Spring Loaded	Range					
Pilot	Size					
	Make					
	Model					
	Spring Range					
	Orifice Size					
	Filter Type					

LINE FILTER

SIZE	GWP	MAKE	MODEL	FILTER ELEMENT, TYPE

RECORDING PRESSURE GAUGE

COMPANY No	SERIAL No.	MFR. No.	MODEL	RANGE	CHART No.	CHART ROTATION	No. PENS
						1D 3D 7D 31D	

CONTROLLER

COMPANY No.	SERIAL No.	MFR. No.	MODEL	RANGE	CHART No.	1D 3D 7D 31D	CYCLE

STATION VALVES

[redacted]	Size	Type	Make	Fig. No.	Flgd. Scrd.	Rated GWP
Outlet	Size	Type	Make	Fig. No.	Flgd. Scrd.	Rated GWP
Bypass	Size	Type	Make	Fig. No.	Flgd. Scrd.	Rated GWP

ENCLOSURE

Above Ground ( ) Pit ( ) Pit Volume_____Cu. Ft. Type Construction_____ Type Closure_____

SCHEMATIC

NOTE: Use this form for future installations or major reconstructions. For existing installations existing sketches may be attached if suitable.

PG&E
Gas Operations
62-6321 (Rev. 4/82)

DISTRICT REGULATOR STATION MAINTENANCE RECORD

Gas FM Station No _____ District/Division _____

Stage *(Use separate sheet for each Stage of Regulation)* _____ Grid Sht. _____

Location _____ Wall Map _____

Use a separate column for each Main Regulator, Standby Regulator, Monitor, Relief Valve or Automatic Shutoff

S.P. 464-2 REFERENCE APPENDIX PARAGRAPH No										
	DATE: mo/day/yr.									
	EMPLOYEE: initial									
	MAIN COMPONENT:									
A1a	Pressure Chart, 24-Hr.	✓								
	Zero Check Chart	✓								
A1b	Filter Differential	W.C.								
A2a	Vault Covers	✓								
A2b	Ground Around Vault	✓								
A2c	Gas Leak Test	% L.E.L.								
A2d	Ventilating System & Relief Stacks	✓								
A2e	Vault Structure & Equipment Condition	✓								
A2f	Regulators, O/P/P & Piping Condition	✓								
A2g	Filter Closures	✓								
A2h	Locking Devices	✓								
A3a	Pressure Setting	PSI, W.C.								
	Lockup Pressure	PSI, W.C.								
A3b	Overpressure Setting	PSI, W.C.								
	Underpressure Setting	PSI, W.C.								
A4	Valves Lubricated	✓								
B1a	Pilot Reg's. Filters	✓								
	Strainers	✓								
	Dehydrators	✓								
B1b	Mechanical Operation	✓								
	Rangeability	✓								
	Diaphragm	✓								
B1c	Valve & Seat	✓								
B2a	Control Lines Loading Supply & Static	✓								
B2b	Restricting Orifices & Filters	✓								
B3a	Exp. Tube Regulator Tube & Core	✓								
B3b	Plug or Ball-type Valve Assembly	✓								
B3c	Cage-type Valve Assembly	✓								
B3d	Linkage	✓								
B3e	Diaphragm	✓								
B4	Return All Equipment, Valves and Locks to Normal Operation and Position									

Line out items not scheduled for inspection, enter check (✓), pressure or % LEL as applicable.

Add additional items as required for specific installations.

On back of this form show work done, other than inspection and testing:

(a) Pressure setting changes and reason;

(b) Parts replacement and reason;

(c) Component replacement;*

(d) Leak repairs or equipment repair;

(e) Miscellaneous work such as pumping pits, touch-up painting, filter blowdown or cleanout, etc.

*Component replacement is also to be posted on "District Regulator Data Sheet."