

PACIFIC GAS AND ELECTRIC COMPANY  
STANDARD PRACTICESTANDARD PRACTICE NO. 462-1EXECUTIVE OFFICE OR DIVISION GAS OPERATIONSPAGE NO. 1 EFFECTIVE 3/1/70ENGINEERING DEPARTMENT GAS DISTRIBUTIONREPLACING  
PAGE NO. \_\_\_\_\_ EFFECTIVE \_\_\_\_\_

## SUBJECT:

REMOVAL AND CONTROL OF LIQUIDS, PIPELINES AND MAINS

Gas Measurement and  
Control Manual, Sec. 17POLICY AND PURPOSE

1. To establish a uniform procedure for the removal and control of liquids from gas pipelines and mains.
2. Insofar as practicable, free liquids shall be removed from all gas pipelines and mains and gas dew points shall be maintained within a range to prevent condensation.

RESCISSIONS

3. Previously issued instructions, oral or written, which may be contrary to this standard practice.

REFERENCES

4. S.P. 460.21-4, "Gas Leakage, Routine Surveys for"  
S.P. 460.01-1, "Gas Measurement and Control Terms, Technical and Special"  
S.P. 460.2-1, "Patrolling, Pipelines and Mains"  
S.P. 460.2-2, "Physical Inspection, Pipelines, Mains and Services"

RESPONSIBILITY

5. The responsibility for removal and control of liquids in gas pipelines or mains shall rest with the supervisors in the divisions and Pipe Line Operations Department, who direct the maintenance and operation of these facilities.
6. Performance shall include: surveying of system to determine sources of liquid, monitoring known sources of liquid, scheduling periodic extraction from drips and separators (for specific intervals see Supplement), operating and maintaining gas dehydration units, taking periodic dew point readings, operating and maintaining inhibitor injection facilities in gas collection systems, inspecting pipelines and mains by means of internal corrosion coupons, establishing and maintaining reports and records of the above, initiating action to install dehydration equipment, liquid removal equipment and inhibiting equipment, and by shutting off gas supplies that produce excessive liquids.

SUPPLEMENT

7. Procedural details for removal and control of liquids in pipelines and mains appear in the Supplement to this standard practice.

PACIFIC GAS AND ELECTRIC COMPANY  
STANDARD PRACTICE

STANDARD PRACTICE NO. 462-1

EXECUTIVE OFFICE OR DIVISION GAS OPERATIONS

PAGE NO. 2 EFFECTIVE 3/1/70

ISSUING DEPARTMENT GAS DISTRIBUTION

REPLACING PAGE NO. \_\_\_\_\_ EFFECTIVE \_\_\_\_\_

SUBJECT: REMOVAL AND CONTROL OF LIQUIDS, PIPELINES AND MAINS Gas Measurement and Control Manual, Sec. 17

APPROVED: E. H. FISHER  
Vice President - Gas Operations

DISTRIBUTION: Division Managers District Gas Supts. or Equal  
District Managers Pipe Line Operations Dept.  
Division Gas Superintendents Director, Procedures Analysis  
Div. Administrative Analyst or Equal Gas Measurement and Control  
Manual Holders

Additional copies of this standard practice may be obtained from Gas Operations, 245 Market Street, San Francisco (PG&E extension 9-1604).

PROCEDURAL DETAILS

Gas Measurement and  
Control Manual, Sec. 17

DEFINITIONS

8. Free liquid is any measurable quantity of liquid, including water, condensate, compressor oil, and any contaminants in solution (or suspended solids) in such liquids.

Liquid removal facilities include equipment such as standard offset drips, skimmer drips, siphon drips, separators and scrubbers with or without storage or automatic dumping features.

Gas dehydration is the removal of water from a gas stream by contacting the stream with glycol or passing the stream through a suitable hygroscopic desiccant.

Inhibitor injection facilities include equipment designed to introduce into the gas stream, chemicals that treat bacteria and/or coat the inner surface of the pipe to protect against acid attack.

Acceptable liquid level limits shall not exceed a level equivalent to 8 pounds of water per million standard cubic feet of gas. (See Exhibit B, "Dew Point Temperature for 8 lb. of Water per Million SCF of Gas at Various Pressures")

LIQUID AT SOURCE

9. A source that produces free liquid with the gas stream shall be immediately controlled by:
- Contacting the responsible producer to eliminate the cause of liquid production, or if this is not successful,
  - Shutting down the responsible source after obtaining clearance from System Gas Control.
  - Installation of shut-off devices, which on detection of liquid water will prevent delivery of gas. Installation of such devices will be made only on approval of the Manager, Natural Gas Production.

REMOVAL OF LIQUID

10. Inspection shall be made to determine the presence of free liquid within the pipelines and other facilities of each collection, transmission or distribution system at least monthly at locations where condensation is likely to take place. Other locations, which in the judgment of the supervisor should be monitored for detection of condensation, may be inspected at whatever intervals the supervisor deems prudent.
- Liquid removal facilities shall be installed at effective locations that will result in the removal and storage of all free liquid that condenses from the gas stream.

- b. At locations where experience or inspection shows condensation may be occurring, a suitable liquid removal device such as a drip or a dehydrator shall be installed at or near the point of formation.
  - c. Major gas regulation and metering stations and transmission line compressor stations shall be equipped with suitable liquid removal facilities, where required.
11. Frequency of inspection and additional action that shall be taken to remove liquids shall be determined from the record maintained of the liquid removed from these extraction points. (See "Reports and Records", paragraph 18)

#### DEHYDRATION PLANTS

12. The Division or Pipe Line Operations Department shall operate and maintain dehydration facilities in gas gathering systems for the purpose of controlling gas stream liquids at the acceptable liquid level limit.
- a. Dew points shall be taken at the gas outlet of the dehydrator absorber(s) and recorded at least monthly at each plant.
  - b. Dew points shall be taken and recorded at least monthly at a point or points along pipelines where additional nondehydrated gases enter a pipeline transporting dehydrated gas.
  - c. Dew points shall be taken and recorded at least monthly at the point of entry of out-of-state gas into the gas system.
  - d. Action shall be taken or initiated by the responsible supervisor to correct conditions when the liquid levels approach acceptable liquid level limits (see paragraph 8).

#### DEHYDRATION OF INSTRUMENT GAS SUPPLY

13. Suitable dehydration equipment shall be installed, operated, and maintained on gas supply sources for instruments at all locations where experience (or design consideration) indicates the necessity.

#### INHIBITOR INJECTION

14. Inhibitor injection facilities shall be installed where required for the purpose of preventing internal corrosion in the pipelines between the gas source and the dehydration plants.
- a. The periodic presence of liquids within sections of collection pipelines, together with knowledge of the presence of corrosive contaminants, shall be used to determine the location and frequency of inspection for internal corrosion (test probe, corrosometer, corrosion coupon, ultrasonic testing, etc.).

- b. The Division or Pipe Line Operations Department shall install inhibitor injection equipment at gas sources feeding into collection systems where internal corrosion is being experienced.
- c. Test points shall be established by installing corrosion coupons or by other prescribed means to enable periodic testing of effectiveness of the inhibitor injection program.
- d. Periodic inspections shall be made at established test points and records shall be maintained on all inspections made.
- e. Frequency of inspections shall be established by the Division or Pipe Line Operations Department.

#### REPORTS AND RECORDS

15. Liquid removal shall be recorded on Form 62-4648 "Daily Patrol and Work Report" to be distributed within the Division or Pipe Line Operations Department as required for proper surveillance and follow up.
16. Dehydration plant inspections shall be recorded on Form 62-3085 "Gas Dehydration Plant Inspection Report" to be distributed monthly within the Division or Pipe Line Operations Department and in the General Office in accordance with the distribution shown on the form.
17. Inhibitor injection system inspections shall be recorded on Form 62-3086 "Gas Inhibitor System Inspection Report" to be distributed monthly within the Division or Pipe Line Operations Department in accordance with the distribution shown on the form.
18. Each Division or Pipe Line Operations Department shall report the following to the Manager of Gas Distribution Department with a copy to the Manager of Gas System Design Department on December 31 of each year:
  - a. Monthly dew point readings at locations described in paragraphs 12b and 12c.
  - b. Presence of free liquid within the pipelines and mains of collection, transmission, and distribution systems.
  - c. Action taken by the responsible supervisor to correct any conditions which resulted in liquid levels exceeding acceptable limits.
  - d. Periodic inspection results using corrosion coupons, corrosometers, non-destructive testing (ultrasonic tester), etc.
19. Unless otherwise required, these records shall be retained a minimum of six years.
20. When it becomes necessary to shut off a local gas source because of liquid production and contacts with the producers have been unsuccessful, the Division or Pipe Line Operations Department shall submit a special confirming report, in letter form to the Manager - Gas Control, with copies to the following Department Managers: Gas Distribution, Gas System Design, Long Range Gas Supply, and Natural Gas Production.

ATTACHMENTS

- Exhibit A - Sample letter reporting temporary termination of gas receipts due to excess liquid carryover.
- Exhibit B - "Dew Point Temperature for 8 lb. of Water per Million SCF of Gas at Various Pressures"

**PG&E****FOR INTRA-COMPANY USES**

DIVISION OR DEPARTMENT (DIVISION)  
 : No. 456  
 RE LETTER OF  
 SUBJECT Shutoff Production From Well 9-48,  
 Ivy League Gas Field

(MANAGER, GAS CONTROL):

Gas receipts were terminated temporarily from Well 9-48 in the Ivy League Gas Field until the producer takes positive steps to prevent free liquid carryover. The well was shut-in with approval of System Gas Control, 9 a.m. on April 18, 1967.

Starting April 1 we have experienced intermittent carryover of free liquid from this well. Contacts with the producer's representative, [REDACTED] have been unsuccessful. Chronologically, the difficulties can be summarized as follows:

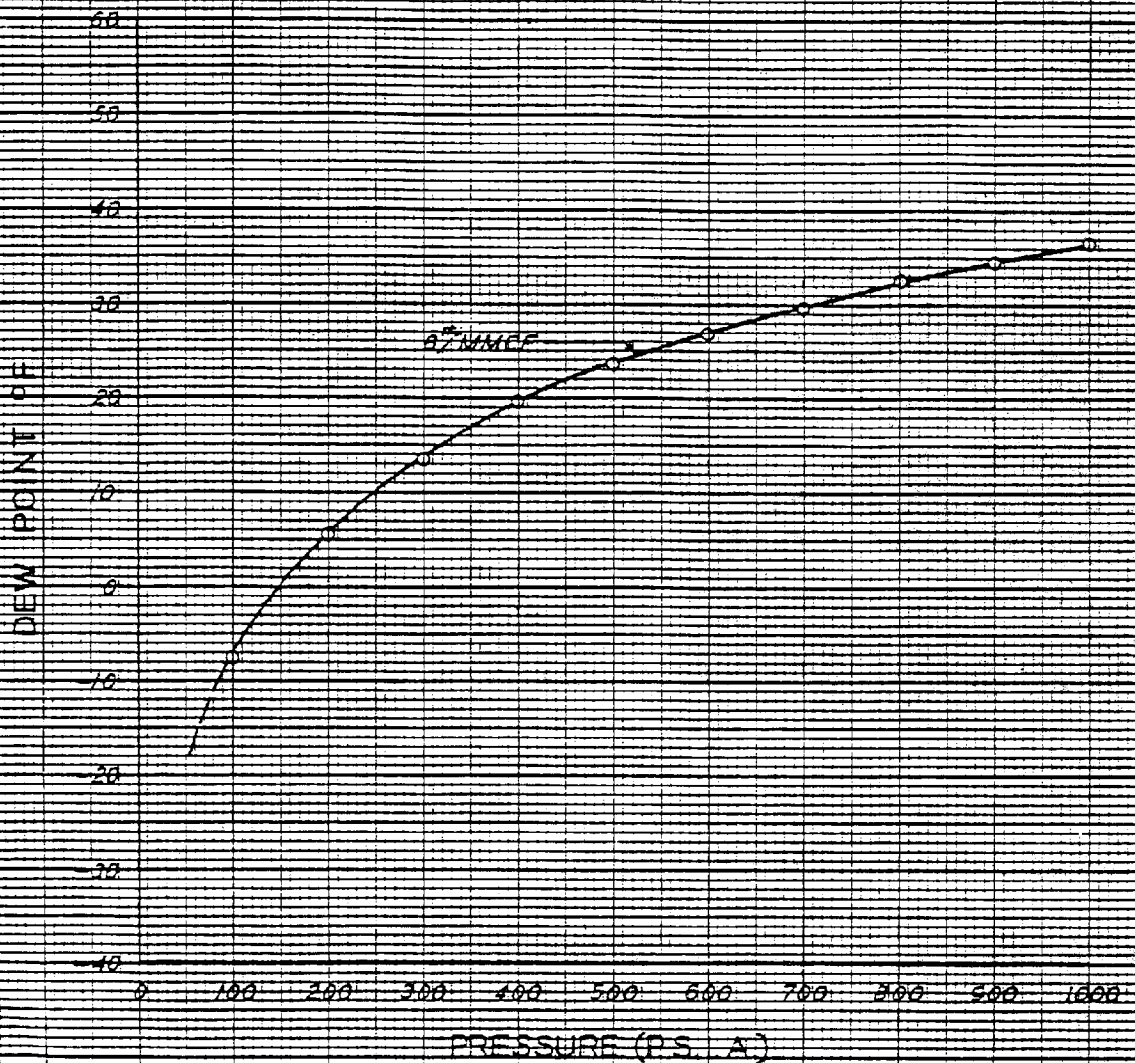
1. April 1, 1967 Removed 10 gallons water from storage drip.
2. April 1, 1967 Contacted producer.
3. April 5, 1967 Removed 20 gallons water.
4. April 5, 1967 Contacted producer (automatic dump malfunction).
5. April 10, 1967 Removed 20 gallons of water.
6. April 10, 1967 Contacted producer (another failure of automatic dump).
7. April 17, 1967 Removed 25 gallons of water. Meter set flooded.  
 Removed 50 gallons from two other downstream storage drips.

Our first storage drip located near the well has a capacity of 25 gallons. It was found dry on all daily checks made before April 1 and was also dry on the days not included in the above list.

The well produces at a steady rate of approximately 2 M<sup>2</sup>cf/day. The producer indicated that more effective water removal facilities will be installed and the well will be ready to operate within a week.

(DIVISION MANAGER)

cc: (Mgr., Gas Distribution Dept.)  
 (Mgr., Gas System Design)  
 (Mgr., Long Range Gas Supply)  
 (Mgr., Natural Gas Production)



ABOVE 87MM LINE - EXCESS WATER  
REF GAS ENGRS HANDBOOK TABLE 4-33

DEW POINT TEMPERATURE FOR 8LB. OF WATER  
PER MILLION SCF OF GAS AT VARIOUS PRESSURES  
PACIFIC GAS AND ELECTRIC COMPANY





DIVISION: \_\_\_\_\_

NATURAL GAS DEHYDRATION PLANT. MAIN NO. \_\_\_\_\_

MONTH	DAY	P.H. READ.	NACAP ADDED GALLON	GLYCOL ADDED GALLON	INLET GAS °F	DEW POINT °F	DEW PT. DEPRESS. °F	TOWER PRESS. PSIG	MAX. RATE MCF/DAY	PSIG AT MAX. RATE	REMARKS
JAN.											
FEB.											
MAR.											
APR.											
MAY											
JUN.											
JUL.											
AUG.											
SEP.											
OCT.											
NOV.											
DEC.											

DISTRIBUTION: 1. DISTRICT SUPERVISOR      3. G.O. GAS DISTRIBUTION DEPT.  
 2. DIV. GAS SUPT./DIV. GAS ENG.      4. G.O. GAS SYSTEM DESIGN DEPT.

# P G and E GAS INHIBITOR SYSTEM INSPECTION REPORT

## INHIBITOR INJECTION RECORD — FIELD LOG

Main No. \_\_\_\_\_ Loc. (Field, Well, Other) \_\_\_\_\_ Division \_\_\_\_\_

Chemical \_\_\_\_\_ Dilution (Chem/Water) 1: \_\_\_\_\_ Piston Dia. \_\_\_\_\_

Date	Gage Level		Qts. Used	Net Qts. Chem.	Qts. Chem. Per Day	Gas Rate M <sup>2</sup> / Day	Actual Qts. / M <sup>2</sup>	Pump Rate S.P.M.	By	Remarks	Inject _____ Qt. / MM
	Initial Found	Final Left									

- DISTRIBUTION:**
1. District Superintendent
  2. Division Gas Supt. / Gas Engr.
  3. G.O. Gas Distribution Dept.
  4. G.O. Gas System Design Dept.
  5. G.O. Dept. Engr. Research