Pacific Gas and Electric Company

CAPACITY REVIEW OF RELIEF DEVICES AT GAS GATHERING RECEIPT POINTS

GT&D
04/10
FH-70-C

Meter Name	District	Gas Field
Pipe Line Number	Meter Number	Anniversary Month (See Note 1 Below)

Part 1 – To Be Completed Annually

This capacity check is for the year											
1. Did production deliveries exceed maximum relief device capacity?	**Yes ***	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maximum relief capacity from Part 2, Section 2 = ____ MMscfD	**No ****	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maximum production delivery since last field review was:	**MMscfD**										
2. Have there been any changes to the equipment, pressures (either inlet or outlet), or flows at this location which could affect the ability of the relief device to limit the pressure to the maximum set point? * Item 1 and 2 are Yes, revise Parts 2 and/or 3 of Annual Cap. Rev. ** If answers to Item 1 and 2 are No, check Yes on Item 3.	**Yes ***	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	No **	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Describe										
3. Does relief device at this meter have adequate capacity? If No, complete Part 3 of Annual Capacity Review.	**Yes ****	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Verified By (Place initials in the appropriate box.)											
Date (Put date verified in the appropriate box.)											
Approved By (Place initials in the appropriate box.)											
Date (Put date approved in the appropriate box.)											

Notes:

1. All pressure relief devices shall be inspected, tested, and the capacity reviewed at intervals not exceeding 15 months, but at least once each calendar year. Furthermore, in addition to the annual capacity testing, the capacity of the relief devices shall be verified immediately when changes are made which could affect the ability of the relief device to protect the connected systems.
2. The **Verified By** box is usually initialed by a technician or an M&C mechanic.
   The **Approved By** box is usually initialed by a district superintendent or area operating supervisor.

General Comments: The relief device protects PG&E's downstream system.

[redacted] [redacted]

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Part 2 – To be revised if Item 2 of Part 1 indicates that a change has occurred.

Meter Name _____ Date _____

District _____ Gas Field _____

Pipe Line Number Supplied by Facility _____

This Capacity Review Was Performed in the Year _____

1. Receipt Point Pressure Conditions

Upstream Regulation? Yes ☐ No ☐ Unknown ☐

P1 – Maximum pressure downstream of meter (MAOP, or MOP if lower) _____ psig

P2 – Maximum permissible downstream pressure (see Par. 192.201) _____ psig

P2 = 75/72 x P1

Comments _____

2. PG&E Relief Device Protecting Line or System Described Above

Relief Device					Maximum Calculated Capacity @ P1 (MMscfD)
Device Manufacturer	Model	Orifice Diameter (inches)	Orifice Area (sq. inches)	Max. Pressure Setting (psig)	

Comments _____

_____

3. The relief device(s) has been installed as described in Part 2 and a copy of the maximum discharge capacity calculation is attached to this form.

Approved by gas engineer _____ Date _____

Verified by Field _____ Date _____

[redacted] [redacted]

CAPACITY REVIEW OF RELIEF DEVICES AT **GAS GATHERING RECEIPT POINTS**

Part 3 – To be completed if Part 1 indicates that relief capacity is inadequate.

Meter Name _____ Date _____

District _____ Gas Field _____

Pipe Line Number Supplied by Facility _____

1. Additional relief capacity required
   (from value in Part 1, Item #1, less Part 2, Item #2). _____ MMscfD
2. Corrective action to be taken
   a. Increase relief capacity (see Item #3, this sheet). ☐
   b. Replace relief equipment with a monitor. ☐
   c. Other. Describe _____
3. If relief capacity is increased by replacing the existing relief equipment with a relief device of larger capacity, Part 3 must be revised and a revised copy of the design calculations attached to this form.
4. Date capacity was found to be inadequate _____

   Comments _____
5. Work to provide adequate overpressure protection completed.

   Job No. _____ Completed on _____

   Description of Work Performed _____

Approved by gas engineer _____ Date _____

Verified by Field _____ Date _____

RETAIN THIS DOCUMENT AS A PERMANENT RECORD FOR THE LIFE OF THE FACILITY.

[redacted] [redacted]

Relief Valve Calculation for Gas Gathering Facilities

Meter Name _____ District _____

Meter No. _____ Gas Field _____

Line No. _____ Set Point _____ psig

Relief Valve Make / Model / Type _____

$$Q = \frac{6.32 \times A \times C \times K \times P1 \times Kb}{\sqrt{(M \times T \times Z)}}$$

Q =		Calculated maximum discharge capacity
A =	_____	Orifice area, square inches Bore = _____ inches
C =	345	Gas constant (use 345 for natural gas as a general composite)
K =	_____	Valve coefficient of discharge (product data sheet)
P1 =	_____	Inlet flowing pressure, psia **(psig + 14.7 psi)**
Kb	1	Back pressure factor (default = 1.0, atmospheric)
M =	19	Molecular weight (use 19 for natural gas as a general composite)
T =	_____	Relief temperature, absolute **(°R = °F + 460°)**
Z =	1	Compressibility factor (if unknown, assume Z = 1.0)

Maximum Discharge Q = _____ MMsch/D

At _____ psig set point

For bursting disks, Crane Tech. Paper #410 is used with inlet pipe

ID for tube nozzle under critical flow conditions

Calculated by _____ Date _____

[redacted] [redacted]