**PACIFIC GAS AND ELECTRIC COMPANY**
**San Bruno Gas Transmission Line Incident**
**Data Response**

| | | | |
|---|---|---|---|
| PG&E Data Request No.: | NTSB_033-006 | | |
| PG&E File Name: | San Bruno GT Line Incident_DR_NTSB_033-006 | | |
| Request Date: | November 2, 2010 | Requesting Party: | NTSB |
| Date Sent: | November 15, 2010 | Requestor: | Operations (Shori) |

## QUESTION 6

Please provide copies of PG&E's procedures related to the determination of control set-points on regulating and over-pressure equipment in general and, in particular, those related to the set-points at Milpitas Terminal.

## ANSWER 6

Attached please find documents PG&E maintains for determining gas regulator and overpressure protection control set-points and alarm limits. PG&E maintains these documents at regulator stations in its transmission system, including at the Milpitas Terminal facility.

The MAOP Data Sheet is used to set the maximum pressure and the Local Gas Transmission Operating Guide to set the minimum pressure. Within these maximum and minimum operating ranges, Gas System Operations sets and adjusts pressures based upon system operational needs.

Below PG&E lists the most pertinent set point and alarm limit documents, and provides a parenthetical explanation of each document:

1. *Establishing Set-points on Overpressure Protection Devices*, PG&E Utility Procedure TD-4125P-07 (This document identifies set-points on overpressure protection devices in PG&E's gas transmission and distribution systems).

2. *Overpressure Protection Device Maximum Settings,* PG&E Drawing No. 183018 (This document provides maximum device settings for each overpressure protection device that protects a segment of gas transmission system).

3. *MAOP of Lines Operating at or over 20% SMYS*, PG&E Drawing No. 086868 (This document defines the MAOP (Maximum Allowable Operating Pressure), MOP (Maximum Operating Pressure) and FDP (Future Design Pressure) for PG&E's gas transmission system. MOP is the maximum pressure at which a gas pipeline system may operate).

4. *Local Gas Transmission Operating Guide* (This document provides gas system operational information, including operating pressure ranges for various pipeline operating conditions, such as winter operations and minimum set pressures).

5. *PG&E Gas SCADA System, Alarm Limits* (This document describes policies for setting alarm limits, including high pressure alarm limits. For Gas Transmission, Hi Limit is set at a maximum of MOP, Hi-Hi Limit is set at or below MOP plus 3 psi).

6. *Operating and Maintenance Instructions (OMI), for Milpitas Terminal*, PG&E Drawing No. 089773 (This document provides operating and maintenance instructions for Milpitas Terminal facility operators, including instructions on gas regulation equipment).

**QUESTION 6A**

We request that for each of the responses to the questions above, PG&E please provide the name(s) of the individual(s) preparing the response.

**ANSWER 6A**

Larry Denniston

# PIPELINE - DATA SHEET
# MAOP OF LINES OPERATING AT OR OVER 20% SMYS

## PURPOSE

This drawing lists the operating limitations and design pressure requirements of backbone and local transmission pipelines, distribution feeder mains (DFMs), and pipe-type high pressure gas underground holders operating at or above 20% of the This drawing is intended to assist Gas System Operations and GT&D in the operations, planning, pipeline maintenance, repairs, and upgrades.

## REFERENCE

See DCS/GTS Standard D-S0430 / S4125 for requirements for establishing and revising the MAOP and MOP of pipeline facilities listed in this drawing.

## CHANGES AND CORRECTIONS

Changes and corrections to the information contained in this drawing should be sent
Manager, Pipeline Engineering
Gas Design and Planning Department
375 N. Wiget Lane, Walnut Creek, CA 94598

## INDEX

## DEFINITIONS

Refer to UO Standard S4125 for definitions of Maximum Operating Pressure (MOP), Maximum Allowable Operating Pressure (MAOP), and Future Design Pressure (FDP).

## GENERAL NOTES

1. Beginning and ending milepoints are shown for transmission numbered pipelines and pipeline segments. Milepoints are not listed for DFMs or collection systems, but are available in GIS system.
2. Notes on MOP limitations are provided in cases where additional information is needed to clarify the reasons or operating circumstances for the limitation. The notes do not address all possible pipeline configurations (e.g., at cross-ties). The information in this drawing should be used in conjunction with operating maps and diagrams to determine operating limitations for specific pipeline configurations or operating scenarios.
3. The MAOP shown is the minimum MAOP for that pipeline or pipeline segment. Sections of the pipeline within a particular pipeline system may be qualified for a greater MAOP. Consult the GIS system database to verify MAOPs and FDPs prior to designing modifications.
4. For continuity, a number of transmission lines and DFMs that are operating less than 20% SMYS are included in the table. These transmission lines are designated by an asterisk (*) in column A, and DFMs are designated by an (X) in column B.
5. This database provides summary of piping systems operating over 20% of SMYS. Due diligence should be exercised when using this data for operating or design purposes. GIS data and other company records should be researched prior to making any significant system modifications.

## CURRENT REVISION

Revision 15. Approved by Doug Davis 3/1/03
Revision 16. Approved by Eric Kirkpatrick 3/15/04
Revision 17. Approved by Dan Thomas 3/10/05
Revision 18. Approved by Todd Hogenson 12/31/07
Revision 19 added footnote (10) to 138B, clarified footnote 10. Approved by TRH. 8/18/08
Revision 20. Approved by Todd Hogenson 3/15/10

MAOP OF NUMBERED TRANSMISSION LINES

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| 2 | 39.81 | | 129.10 | MP 39.81 (north of Panoche Station) to Vernalis Tap | 26,36 | 890 | 890 | 890 |
| 2 | 129.10 | | 142.50 | Vernalis Tap to Tracy Station | 26 | 890 | 890 | 890 |
| 2 | 142.50 | | 158.00 | Tracy Station to Brentwood Terminal | 26 | 890 | 890 | 890 |
| 21A | 12.05 | | 31.84 | Napa "Y" Meter Station to V31.84 | 8,12,24,26 | 450 | 450 | 675 |
| 21B | 0.00 | | 18.64 | Napa "Y" Meter Station to Adobe Meter Station | 12,16 | 450 | 450 | 720 |
| 21C | 31.84 | | 53.12 | Adobe Meter Station to Santa Rosa Compressor Sta. | 12,16,20 | 450 | 450 | 675 |
| 21C-1 | 35.22 | | 36.26 | McDowell Rd Tap to Petaluma Reg. Sta. | 12 | 450 | 450 | 675 |
| 21D | 18.64 | | 31.81 | Adobe Meter Sta. to Laguna de Santa Rosa (Tap 44.90-21C) | 16 | 450 | 500 | 675 |
| 21D-1 | 0.00 | | 1.15 | Hearn (Tap 49.05) to Sebastopol Rds (Tap 50.19) | 12,16 | 450 | 675 | 675 |
| 21E | 53.12 | | 137.38 | Santa Rosa Compressor Station to Willits | 8,10,12,16 | 610 (32) | 720 | 720 |
| 21F | 0.00 | | 21.11 | Adobe Meter Station to San Rafael Underground Holder | 12,16,20 | 450 | 500 | 500 |
| 21G | 0.00 | | 20.82 | Adobe Meter Station to San Rafael Underground Holder | 12,16,20 | 450 | 500 | 500 |
| 21H | 0.00 | | 1.07 | Crockett Station to MP 1.07 | 24,26 | 400 | 473 | 675 |
| 21H | 1.07 | | 1.52 | MP 1.07 to Herrmann Station | 24 | 400 | 675 | 675 |
| 21H | 1.52 | | 2.65 | Herrmann Station to MP 2.65 | 12,16 | 250 | 375 | 585 |
| 21H | 2.65 | | 2.71 | MP 2.65 to Vallejo Station | 16 | 250 | 258 | 585 |
| 21H | 2.71 | | 12.05 | Vallejo Station to Napa "Y" | 12,16 | 250 | 275 | 585 |
| *50A-1 | 0.00 | | 2.87 | MP 0.00 (near Marysville Service Center) to Yuba City UG Holder | 8, 12 | 400 | 400 | 720 |
| *50A | 2.87 | | 16.93 | Yuba City UG Holder to Gridley Junction Station | 8 | 250 | 250 | 720 |
| *50A | 16.93 | | 26.94 | Gridley Junction Station to Richvale "Y" | 6,8 | 250 | 250 | 720 |
| *50A | 26.94 | | 45.05 | Richvale "Y" to Butte Station | 6,8,10,12 | 400 | 400 | 720 |
| 50B | 0.00 | | 7.81 | MP 0.00 to Paradise | 8 | 400 | 720 | 720 |
| 56 | | | | Pleasant Creek Storage Field | 4 | 1300 | 1300 | 1440 |
| 56 | | | | Pleasant Creek Storage Field | 4,8 | 1300 | 1440 | 1440 |
| 57 | | | | McDonald Island Field UG Storage System | 4-12 | 2160 | 2160 | 2160 |
| 57A | 6.34 | | 16.64 | Old River PLS to Brentwood Term | 14,16,18 | 722 | 722 | 867 |
| 57B | 0.00 | | 16.46 | Brentwood Terminal to McDonald Is. Field UG Storage | 22 | 2160 | 2160 | 2160 |
| 57C | 0.00 | | 6.44 | McDonald Island Compr Sta to Palm Tract Sta | 24 | 2160 | 2160 | 2160 |
| 65 | | | | SP3 (Tl 76.70) to Los Medanos Compr. Sta. | 12,20,22 | 600 | 720 | 720 |
| 65 | | | | Los Medanos Field Storage System | 4,20,22 | 1800 | 1800 | 1800 |
| 100 | 138.43 | | 150.13 | MP 138.43 to MilpitasTerminal | 20 | 375 (8) | 400 | 400 |
| 101 | 0.00 | | 32.17 | Milpitas Terminal to SFO tap | 20,24,30,34,36 | 375 (8) | 400 | 400 |
| 101 | 32.17 | | 33.68 | SFO tap to Lomita Park Reg. Sta. | 20 | 375 (8) | 396 | 400 |
| *101 | 33.68 | | 44.55 | Lomita Park Reg Sta to San Francisco Gas Load Center | 20,24 | 145 (1) | 275 | 275 |
| *103 | 0.00 | | 23.55 | Bolsa Meter & Reg Sta to California St. Reg Sta | 12 | 350 | 350 | 500 |

MAOP OF NUMBERED TRANSMISSION LINES

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| *103 | 23.55 | | 27.74 | California St. Reg Sta to Harkins Rd. Mtr & Reg Sta | 8,10,12 | 313 | 313 | 500 |
| *105A | 37.00 | | 52.01 | V-2.03 (L-105C) to San Pablo Station | 20,24,30 | 150 | 198 | 275 |
| 105B | 0.00 | | 11.80 | Crockett Station to San Pablo Station | 24 | 400 | 473 | 675 |
| 105B | 0.00 | | 0.67 | Crockett Station to Crockett Cogeneration Meter Station | 16 | 400 | 675 | 675 |
| 105C | 0.00 | | 2.03 | End of L-105N (5th St.) to beginning L-105A (V-0.00) at | 20,22,24 | 150 | 198 | 275 |
| 105N | 0.00 | | 0.18 | Baine Avenue Crossover to Line 153 (GIS X6379) | 20 | 250 | 250 | 500 |
| 105N-2 | 0.00 | | 1.29 | West Winton Ave Crossover to Line 153 | 16,22,24 | 250 | 250 | 500 |
| 105N | 6.88 | | 23.03 | Irvington Sta to San Lorenzo Reg Sta | 20-34 | 250 | 250 | 500 |
| *105N | 23.03 | | 36.48 | San Lorenzo Reg Sta to Oakland Gas Load Center | 16,20,24-34 | 150 | 198 | 275 |
| 107 | 13.11 | | 31.22 | Livermore Junction to Irvington Station | 22,24,36 | 477 | 477 | 720 |
| 107S | 31.22 | | 33.20 | Irvington Station to MP 33.2 | 22,24 | 477 | 477 | 720 |
| 107S | 33.20 | | 38.12 | MP 33.2 to Milpitas Station | 36 | 477 | 720 | 720 |
| 108 | 0.00 | | 4.59 | Vernalis Tap & Meter Sta. to Vernalis Field Valve Lot | 24 | 720 | 1040 | 1040 |
| 108 | 4.59 | | 11.70 | Vernalis Field Valve Lot to Ripon-Modesto Meter Sta. | 24 | 720 | 720 | 720 |
| 108 | 11.70 | | 22.31 | Ripon-Modesto Meter Sta. to Airport Way & French Camp Rd. Station | 16, 24 | 408 | 408 | 720 |
| 108 | 22.31 | | 43.50 | Airport Way & French Camp Rd. Station to Las Vinas Station | 16, 24 | 412 | 412 | 720 |
| 108 | 43.50 | | 50.70 | Las Vinas Station to Thornton Meter Sta. | 16 | 412 | 490 | 720 |
| 108 | 50.70 | | 61.67 | Thornton Reg Sta to Elk Grove-Clarksburg Primary Reg Sta | 24" | 412 | 720 | 720 |
| 108 | 61.67 | | 75.10 | Elk Grove-Clarkson Primary Sta to Sacramento Gas Load Center | 16,20,24 | 412 | 412 | 720 |
| 109 | 0.00 | | 43.47 | Milpitas Terminal to Sullivan Ave Reg Sta | 22,24,30,34 | 375 | 375 | 400 |
| *109 | 43.47 | | 52.71 | Sullivan Ave Reg Sta to San Francisco Gas Load Center | 24,26,30,34 | 145 (1) | 150 | 275 |
| 111-A | 0.00 | | 21.64 | Helm Jct. Meter & Regulator Station to Fresno Junction | 12,16 | 650 | 650 | 720 |
| 111-A | 21.65 | | 28.05 | Fresno Junction to Fresno Gas Load Center | 8 | 400 | 400 | 720 |
| 111B | 2.63 | | 6.99 | Sim Cal Chemical Tap to V-6.99 | 16 | 650 | 650 | 720 |
| 112 | | | | Vernalis Field Collection System | 3-8 | 720 | 720 | 890 |
| 114 | 0.00 | | 9.01 | Rio Vista Field West Side to Antioch Terminal | 12,16 | 510 | 510 | 800 |
| 114 | 7.33 | | 8.31 | San Joaquin River X-ing Block Valve 7.46 on SP4 to Block Valve 8.31 on Line 114 | 12 | 720 (3) | 800 | 800 |
| 114 | 9.01 | | 16.59 | Antioch Terminal to Brentwood Terminal | 20,22,24 | 497 (4) | 497 | 720 |
| 114 | 16.59 | | 26.84 | Brentwood Terminal to MVL-26.84 | 22,24,36 | 497 (5) | 595 | 720 |
| 114 | 26.84 | | 28.97 | MVL-26.84 to Dalton Ave. Crossover | 20, 22 | 497(5) | 595 | 720 |
| 114 | 28.97 | | 33.85 | Dalton Ave. Crossover to Livermore Junction | 36 | 497 | 595 | 720 |
| 115 | | | | Petaluma Gas Field | 2 | 450 | 675 | 675 |
| 116 | 0.00 | | 0.02 | West Sacramento Crosstie to Line 172 | 12 | 720 | 720 | 720 |

MAOP OF NUMBERED TRANSMISSION LINES

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| *116 | 0.00 | | 3.86 | Davis Mtr and Reg Sta to Swingle Jct Mtr and Reg Sta | 8 | 200 (31) | 500 | 720 |
| 116 | 3.86 | | 6.18 | Swingle Junction Meter and Reg Sta to MP 6.18 | 16 | 720 | 720 | 720 |
| 116 | 6.18 | | 9.60 | MP 6.18 to MLV-9.60 | 16 | 720 | 720 | 720 |
| 116 | 9.60 | | 12.89 | MLV-9.60 to Sacramento Gas Load Center | 16, 24 | 720 | 720 | 720 |
| *118A | 0.00 | | 6.09 | Fresno Gas Load Center to Fresno Junction | 8 | 400 | 400 | 500 |
| *118A | 5.86 | | 12.57 | Fresno Junction to MP 12.57 | 12 | 400 | 400 | 720 |
| *118A | 12.57 | | 73.26 | MP 12.57 to Livingston Reg Station | 8,12 | 400 | 400 | 500 |
| 118A | 73.26 | | 74.89 | Livingston Reg Station to Collier Road | 6,12 | 400 | 720 | 720 |
| 118A | 74.89 | | 83.74 | Collier Road to Bradbury Road Reg Station | 6,8,10 | 400 | 400 | 720 |
| 118A/E | 83.74 | | 84.69 | Bradbury Road Reg Sta to MP 84.69 (Line 215 Tap) *parallel lines* | 6,8 | 890 | 890 | 890 |
| 118B | 0.00 | | 38.39 | Tap 12.55 to Athlone - 12" Parallel | 12 | 400 | 400 | 720 |
| 118D | 78.08 | | 83.79 | MP 78.08 to Bradbury Road Reg Station | 8 | 400 | 720 | 720 |
| 119A | 0.00 | | 3.85 | Davis Mtr Sta to Swingle Junction Reg and Mtr Sta | 12 | 792 | 792 | 800 |
| 119A | 3.85 | | 4.85 | Swingle Junction Reg and Meter Sta to MP 4.85 | 12,16 | 720 | 720 | 720 |
| 119A | 4.85 | | 16.46 | MP 4.85 to North Sacramento UG Holder | 10,12,20 | 720 | 720 | 720 |
| 119B | 0.00 | | 10.17 | N. Sacramento UG Holder to Antelope Meter Station | 12,16 | 500 | 500 | 720 |
| 119C | 0.00 | | 6.69 | N. Sacramento UG Holder to Roseville Rd. Reg Station | 16 | 500 | 500 | 720 |
| 119D | 0.00 | | 5.25 | Sonoma Ave and Del Paso Blvd Reg to Roseville Rd Reg Sta | 6 | 180 | 500 | 720 |
| 120 | | | | Sutter Creek Field Collection System | 4,6 | 485 (6) | 492 | 720 |
| 120 | | | | Sutter Buttes Field Collection System | 4,6 | 485 | 485 | 720 |
| 121 | 0.00 | | 6.97 | Marysville Buttes Mtr Sta to Township and Almendra | 6 | 485 | 485 | 975 |
| 121 | 6.97 | | 9.06 | Township and Almendra to Butte House w/o Elmer | 8 | 485 | 975 | 975 |
| 121 | 9.06 | | 11.73 | Butte House w/o Elmer To Yuba City UG Holder Sta | 8 | 485 | 720 | 720 |
| 121-1 | 9.05 | | 10.61 | Butte House w/o Elmer (T-9.05)to W. Onstott Rd | 8 | 485 | 720 | 720 |
| 123 | 0.00 | | 13.57 | Antelope Mtr Sta to Lincoln Junction Reg Sta | 12,16 | 500 | 500 | 720 |
| 124A | 0.00 | | 26.03 | Lincoln Jct Reg Sta to Yuba City UG Holder | 12,16 | 600 | 600 | 720 |
| 124B | 0.00 | | 23.46 | Lincoln Jct Reg Sta to MP 23.46 (near Marysville Service Center) | 8,10 | 400 | 400 | 720 |
| 124C | 0.00 | | 2.87 | Beale AFB Tap (Tap 13.31) to Camp Far West Mtr Sta (Tap 2.87) | 6 | 600 | 600 | 720 |
| *124C-1 | 2.87 | | 3.76 | Camp Far West Mtr Sta to Beale AFB Reg. Sta. | 4,6 | 395 | 400 | 720 |
| 125 | | | | Edwards Vicenus to Tompkins Hill Mtr and Reg Sta | 4 | 350 | 448 | 720 |
| 125 | | | | Tompkins Hill Field Collection System | 2-6 | 448 | 448 | 720 |
| 126A | 0.00 | | 10.89 | Tompkins Hill Mtr & Reg Sta to Union St. Reg Sta | 6 | 350 | 425 | 425 |
| 126A | 10.89 | | 12.61 | Union St. Reg Station to Line 137 | 6 | 167 | 167 | 275 |

MAOP OF NUMBERED TRANSMISSION LINES

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| 126B | 0.00 | | 10.57 | Tompkins Hill Mtr & Reg Sta to Union St. Reg Sta | 4 | 350 | 425 | 425 |
| 126C | 0.00 | | 3.60 | Elk River Road Reg Sta to Tap 12.38, Line 126D | 10 | 167 | 167 | 600 |
| *126D | 12.22 | | 12.57 | Tap 12.22 on Line 126A to Eureka Meter & Reg Sta | 10 | 167 | 167 | 600 |
| 128 | 0.00 | | 13.65 | Perch Slough (V-1.65) to Willows Reg Sta | 3,4,6 | 479 | 479 | 720 |
| 130A | 0.00 | | 0.50 | HP Rio Vista Sacramento River Crossing | 10 | 800 (16) | 800 | 800 |
| 130B | 0.00 | | 0.50 | LP Rio Vista Sacramento River Crossing | 10 | 99 | 99 | 720 |
| 131Y | 0.01 | | 0.75 | Brannan Is. To L-195Y (just S/O 3 Mile Slough | 10,12 | 510 (7) | 720 | 720 |
| 131Z | 0.00 | | 0.74 | Brannan Is. (V-84) to L-195Z (just S/O 3 Mile Slough) | 10,12 | 510 (7) | 685 | 720 |
| 131 | 5.81 | | 9.19 | Sherman Is. (V-102&104) to Antioch Terminal | 10,12 | 685 (7) | 720 | 720 |
| 131 | 13.33 | | 16.87 | MP 13.33 to Brentwood Terminal | 24 | 495 | 495 | 720 |
| 131 | 16.87 | | 20.88 | V-16.87 (Brentwood Terminal) to V-20.88 (at Vasco Rd) | 24 | 500 | 525 | 720 |
| 131 | 24.88 | | 50.57 | Tap 24.88 on Line 114 to Irvington Station | 24 | 500 | 525 | 720 |
| 131 | 50.57 | | 57.45 | Irvington Station to Milpitas Terminal | 30,34 | 590 | 595 | 650 |
| 132 | 0.00 | | 46.59 | Milpitas Terminal to Martin Station Reg Station | 24,30,34,36 | 375 (8) | 400 | 400 |
| 132 | 46.59 | | 51.50 | Martin Sta Reg Sta to San Francisco Div Gas Load Ctr | 24 | 145 | 145 | 275 |
| 132A | 0.00 | | 1.50 | Sierra Vista Ave Crossover to Rengstorff Ave Sta | 16,24 | 375 (8) | 400 | 400 |
| 132B | 0.00 | | 0.35 | Martin Sta Reg Sta to Geneva Ave | 20,24 | 145 (9) | 275 | 275 |
| 134 | 0.00 | | 34.14 | Herndon Junction to Firebaugh Reg Sta | 3,4,6,8 | 500 | 500 | 720 |
| 134 | T-21.62 | | | Tap 21.62 to Moffat-Dixon Meter Station | 4 | 500 | 500 | 720 |
| 136 | 5.14 | | 12.89 | Fell Reg and Odorizer Station to Butte Station | 6,8 | 550 | 550 | 720 |
| *137A | 0.00 | | 3.74 | 14th and Albee Street, Eureka, to Ryan Slough Reg Station | 6,8 | 167 | 167 | 275 |
| 137B | 0.00 | | 7.37 | Ryan Slough Reg Station to Arcata Reg Station | 8 | 350 | 350 | 600 |
| *137C | 0.00 | | 9.42 | Reade and Pennsylvania Ave, Eureka, to Arcata Reg Station | 4 | 167 | 167 | 275 |
| 137D | 0.00 | | 3.11 | Arcata Reg Station to Guintoli Lane Reg Station | 10 | 250 | 350 | 600 |
| 138 | 14.71 | | 20.50 | Helm Junction to Elkhorn Station | 18 | 800 (10) | 865 | 890 |
| 138 | 20.50 | | 22.04 | Elkhorn Station to Burrel Meter Station | 18 | 650 | 650 | 720 |
| 138 | 22.04 | | 38.59 | Burrel Meter Station to Adams & Elm Meter and Reg Sta | 16 | 650 | 650 | 720 |
| 138 | 38.59 | | 49.42 | Adams & Elm Mtr & Reg Sta to Fresno Gas Load Center | 10,12,16 | 650 | 650 | 720 |
| 138 | 43.58 | | 50.02 | Tap 43.58 to Chestnut & Clay Reg Station | 16 | 650 | 650 | 720 |
| 138 | 45.10 | | 46.64 | MP 45.10 to Peach Avenue | 10 | 650 | 720 | 720 |
| 138A | 0.00 | | 14.94 | Helm Tap Station to Helm Junction | 16 | 800 (10) | 862 | 862 |
| 138B | 0.00 | | 14.71 | Helm Tap Station to Helm Junction | 20 | 800 (10) | 945 | 945 |
| 142N | 0.00 | | 14.05 | Bakersfield Tap to Bakersfield Reg Station | 12,16,20,24 | 475 | 475 | 720 |
| 142S | 0.00 | | 9.00 | Gosford Road Mtr Sta to Brundage Lane & "V" St. Reg | 10 | 478 | 600 | 720 |
| *142S | 9.00 | | 11.47 | Brundage Lane & "V" St. Reg to Bakersfield Reg Sta | 10 | 300 | 300 | 720 |
| *143 | | | | Millar Field Collection Systen | 3,4 | 792 | 800 | 800 |

MAOP OF NUMBERED TRANSMISSION LINES

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| 144 | 0.00 | | 3.50 | Millar Field to Millar Meter Station | 10,12 | 792 | 796 | 800 |
| 146 | 0.00 | | 6.00 | Maine Prairie Field to Maine Prairie Meter Station | 8 | 510 | 796 | 800 |
| 147 | 0.00 | | 3.57 | Edgewood Rd. Crossover to V-3.57 | 20,24 | 375 | 400 | 400 |
| 148 | 0.00 | | 17.63 | McMullin Ranch Mixer Station to Morgan Rd. Reg Sta | 8 | 408 | 408 | 720 |
| 150 | 4.70 | | 15.53 | Winters Meter Station to V-15.53 | 6 | 125 (31) | 750 | 800 |
| 150 | 15.53 | | 18.09 | V-15.53 to Davis Meter Station | 6 | 200 (31) | 750 | 800 |
| 151 | 0.53 | | 14.05 | MP 0.53 to Afton Reg Station | 6 | 250 | 250 | 720 |
| 153 | 0.00 | | 18.03 | Irvington Station to Marina Blvd Station | 24,30,32,34 | 420 | 420 | 500 |
| *153 | 18.03 | | 27.83 | Marina Blvd Station to Oakland Gas Load Center | 16,20,24,30 | 246 | 246 | 275 |
| 153 | 9.20 | | | Alvarado Crossover & Reg Station to Line 105 (GIS X6458) | 16 | 420 | 420 | 500 |
| *153 | 17.63 | | | Fairway Ave Crossover Station to Line 105 (GIS X6460) | 20,24,30 | 150 | 198 | 500 |
| 156 | 1.13 | | 5.72 | Grainland Road DRS to Durham Field Valve Lot | 6 | 550 | 680 | 800 |
| 158 | 4.80 | | 11.06 | V-4.80 to L-172 (MP 11.06) | 6 | 800 | 800 | 800 |
| 158 | 11.06 | | 13.65 | MP 11.06 to Dunnigan Spreckels Reg Station | 6 | 500 | 564 | 800 |
| 159 | 0.65 | | 3.91 | V-0.65 to Pleasant Creek Line 159 Reg Station | 4 | 975 | 975 | 975 |
| 159 | 3.91 | | 4.70 | Pleasant Creek Line 159 Reg Sta to Winters Meter Sta | 4,8 | 125 (31) | 750 | 975 |
| *162 | 0.00 | | 9.03 | Tracy Station to Banta Road Reg Station | 4, 6, 8, 10 | 365 | 365 | 720 |
| 164 | 0.00 | | 6.14 | Coalinga Tap to MP 6.14 | 8,10,16 | 498 | 498 | 890 |
| 167 | 0.00 | | 34.50 | Beehive Bend Field to Yuba City UG Holder | 12,16 | 800 | 800 | 800 |
| 167 | 0.00 | | 4.60 | Wild Goose Field Meter Sta to Wild Goose Mixer Station | 10 | 800 | 800 | 800 |
| 167 | 4.60 | | 6.54 | Wild Goose Mixer Sta to Gridley Jct Sta | 8 | 800 | 800 | 800 |
| 167 | 4.12 | | 7.60 | Princeton Field Collection System | 3 | 800 | 800 | 800 |
| 168 | | | | River Island Field Collection System | 2-8 | 800 (11) | 800 | 800 |
| 169 A/B/C | | | | Beehive Bend, Willows, Llano Seco & Perkins Lake Field Collection System | 3-20 | 800 | 800 | 800 |
| 172A | 40.07 | | 69.81 | West Beehive Bend Meter & Odorizer Sta to Swingle Junction Reg & Mtr Station | 18,20 | 800 | 800 | 800 |
| 172A | 69.81 | | 79.12 | Swingle Junction Reg & Mtr Station to Sacramento Gas Load Center | 12,16,18 | 500 | 520 | 720 |
| 172B | 0.00 | | 0.60 | Crosstie between Line 172 (V-3.54) and Line 167 (V-4.12) Collection System | 6,10 | 800 | 800 | 800 |
| 172C | 75.45 | | 9.68 | Crosstie between Line 172 (V-75.45) and Line 119 (V-9.68) | 12 | 720 | 720 | 720 |
| 172D | 0.00 | | 2.84 | Tap off of L-172A (at milepoint 24.41) | 6" | 800 | 800 | 800 |
| *173 | 0.00 | | 17.56 | Turkey Ranch Meter Station to Auburn Reg Station | 4,6,8,12 | 500 | 500 | 720 |
| *174 | | | | Arbuckle Field Collection System | 2-10 | 800 | 800 | 800 |
| 176 | 11.50 | | 18.85 | Old River to Tracy Station | 6,8 | 365 | 555 | 365 |

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| 177 | V-37.80 | | V-149.18 | Crosstie between Lines 177 and Line 400 (within Gerber Compressor Station) | 12 | 819 | 819 | 960 |
| 177A | 0.00 | | 4.75 | Fell Reg & Odorizer to Sacramento Ave Junction | 16 | 819 | 819 | 960 |
| 177A | 4.75 | | 29.09 | Sacramento Ave Junction to Corning N. Dome Station | 10 | 819 | 819 | 960 |
| 177L | 0.00 | | 2.19 | Tap 27.60 to Tap 29.87 Parallel Section Near Corning N. Dome | 6,8 | 819 | 819 | 960 |
| 177A | 29.09 | | 37.84 | Corning N. Dome Station to Gerber Compressor | 12 | 819 | 819 | 960 |
| 177A | 37.84 | | 163.04 | Gerber Compressor Sta to Cummings Creek PL Station | 12 | 819 | 819 | 960 |
| 177A | 163.04 | | 178.18 | Cummings Creek PL Station to Tompkins Hill Mtr & Reg Sta | 12 | 430 | 430 | 720 |
| 177A | 178.18 | | 192.29 | Tompkins Hill Mtr & Reg Sta to Ryan Slough Reg Sta | 12 | 350 (12) | 425 | 600 |
| 177B | 0.00 | | 0.86 | Sacramento Ave Junction to Grape Way Req Station | 10 | 819 | 819 | 960 |
| 177B | 0.86 | | 7.51 | Grape Way Reg Station to Butte Station | 6,10 | 469 | 469 | 720 |
| 177E | 43.87 | | 1.24 | Red Bluff Tap to Red Bluff and Diamond Nat'l Corp. | 6 | 819 | 819 | 960 |
| 181A-10 | 0.00 | | 5.69 | L-301/L-181A Valve Lot to San Juan Rd Reg Station | 12 | 500 | 500 | 500 |
| 181A | 15.29 | | 20.01 | San Juan Rd Reg Station to Front St Reg Station | 10,12 | 303 | 303 | 400 |
| 181B | 0.00 | | 2.10 | Anzar Rd. Mtr and Reg to Cole Road Reg Sta | 10 | 500 | 500 | 500 |
| 181B | 2.10 | | 10.85 | Cole Road Reg Sta to MP 10.85, Watsonville | 10,16,20 | 400 | 400 | 500 |
| *182 | 0.00 | | 12.86 | Serpa "Y" to V-12.86, Suisun Junction | 8,10 | 510 | 510 | 800 |
| 182 | | | | Suisun Field Collection System | 2-6 | 510 | 510 | 800 |
| 183 | 0.00 | | 6.35 | Moffat Ranch Field Mtr & Reg Sta to Firebaugh Reg Sta | 3 | 175 | 320 | 800 |
| 185 | 0.00 | | 0.014 | Hollister Gas Field Tie to Line 301 A | 4 | 396 | 396 | 500 |
| 186 | 0.00 | | 26.10 | Red Top Reg to Dos Palos Meter Station | 3,4,6 | 270 (30) | 625 | 720 |
| 186 | 26.10 | | 29.40 | Chowchilla Field to Red Top Reg Station | 2,3,4 | 270 (30) | 960 | 960 |
| *187 | 0.56 | | 22.58 | San Ardo Field to Jolon Road Reg Station | 6 | 313 | 313 | 720 |
| *187 | 22.58 | | 65.70 | Jolon Rd. Reg Sta to Harkins Rd. Mtr & Reg Sta | 8 | 313 | 313 | 720 |
| 189 | 0.00 | | 1.72 | Humboldt Bay PP Tap to Humboldt Bay PP Primary Reg Sta | 10 | 350 (14) | 425 | 600 |
| 190 | 0.00 | | 16.08 | Kettleman Compr Sta to Coalinga Nose Dehydrator Sta | 12,16 | 840 | 1440 | 2160 |
| 191 | 0.00 | | 3.87 | Antioch Terminal to Antioch Town Meter Station (V-3) | 30,34 | 600 | 600 | 600 |
| 191 | 3.86 | | 3.87 | Antioch Town Meter Station Cross Tie | 16 | 600 | 600 | 600 |
| 191 | 3.86 | | 9.93 | Antioch Town Meter Station (V-3) to SP 3 Line 191 Meter | 20,24 | 338 (15) | 390 | 600 |
| 191 | 9.46 | | 10.60 | Pittsburg Power Plant Feeder | 24 | 338(15) | 390 | 600 |
| 191 | 9.93 | | 25.30 | SP 3-Line 191 Meter Sta to Reliez Sta Rd. Reg Sta | 12,16,20 | 338 | 338 | 600 |
| *191 | 25.30 | | 29.36 | Reliez Sta Rd. Reg Sta to The Junction | 8,10,12 | 268 | 283 | 400 |
| *191 | 29.36 | | 32.76 | The Junction to MP 32.76 | 10 | 268 | 270 | 400 |
| *191 | 32.76 | | 35.83 | MP 32.76 to Martinez Meter | 10 | 268 | 268 | 400 |

MAOP OF NUMBERED TRANSMISSION LINES

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| *191A | 0.00 | | 6.33 | The Junction to Ardilia Reg Sta (MP 6.13) and Orinda Reg Sta (MP 6.33) | 3,6,8 | 268 | 283 | 400 |
| *191B | 0.00 | | 1.53 | The Junction to Reliez Valley Rd, Lafayette | 8 | 268 | 283 | 400 |
| 193 | | | | Rice Creek Field Collection System | 2-8 | 819 | 960 | 960 |
| 193 | | | | Malton Field Collection System | 4,6,8 | 819 | 960 | 960 |
| 193 | | | | Kirkwood & Rice Creek Field, North, Collection System | 6 | 819 | 819 | 960 |
| 194 | | | | McMullin Ranch Field Collection System | 2-10 | 720 | 720 | 800 |
| 195 | | | | Rio Vista Field, East Side Collection System (HP) | 2-16 | 800 (16) | 800 | 800 |
| *195 | | | | Rio Vista Field, East Side Collection System (LP) | 2-16 | 110 | 110 | 510 |
| 195Y | 0.00 | | 0.55 | Sherman Is., S/O 3 Mile Slough to SP4Y (V-92) | 12 | 510 (7) | 720 | 800 |
| 195Z | 0.00 | | 0.55 | Sherman Is., S/O 3 Mile Slough to SP4Y (V-93) | 12 | 510 (7) | 720 | 800 |
| 196 | | | | King Island Gas Field Collection System | 4,6 | 800 | 800 | 800 |
| 196 | 0.00 | | 13.45 | Isleton Meter Station to Las Vinas Station | 8,12,16 | 800 (16) | 800 | 800 |
| 197A | 0.00 | | 21.41 | Las Vinas Station to Brandt Road PLS | 10 | 300 (28) | 388 | 720 |
| 197A | 21.41 | | 31.23 | Brandt Road PLS to MP 31.23 | 10,12 | 300 (28) | 720 | 720 |
| 197A | 31.23 | | 39.98 | MP 31.23 to MP 39.98 | 8,**12** | 300 (28) | 320 | 720 |
| 197B | 0.00 | | 5.19 | Las Vinas Station to V-5.19 | 6,12 | 300 (28) | 388 | 720 |
| 197C | 17.44 | | 23.02 | lone Tap to MP 23.02 | 4, 6, 10 | 300 (28) | 720 | 720 |
| 199 | | | | Bunker Field Collection System | 3-8 | 792 | 796 | 800 |
| 200 | | | | Rio Vista Field, West Side, Collection System (HP) | 2-16 | 800 (17) | 800 | 800 |
| *200 | | | | Rio Vista Field, West Side, Collection System (LP) | 2-16 | 110 | 110 | 510 |
| 200 | 0.00 | | 6.51 | Rio Vista Field, West Side, Collection System (LP), Rio Vista "Y Mixer Sta to Serpa Jct Compr Sta | 12 | 510 | 800 | 800 |
| 200 | | | | Lindsey Slough Field Collection System | 3-10 | 510 (17) | 868 | 960 |
| 201 | | | | Todhunters Lake Field Collection System | 2-12 | 800 | 960 | 960 |
| 202 | 0.00 | | 23.72 | Camp Far West Mtr Sta to Grass Valley Reg Sta | 6,8 | 600 (34) | 720 | 720 |
| 206 | 0.00 | | 0.67 | Pleasant Creek Tap to Pleasant Creek Field Compr Sta | 12 | 975 (18) | 1440 | 1440 |
| 207 | | | | Conway Ranch Field Collection System | 4,6,8 | 800 | 1000 | 960 |
| 208 | | | | Union Island Field to Lathrop Dehydrator | 12 | 825 (19) | 1000 | 1000 |
| 209 | 0.00 | | 4.06 | Johns Manville Reg Station to 5th and Garden, Willows | 4 | 479 (20) | 720 | 720 |
| 210A | 0.00 | | 1.36 | Rio Vista "Y" to Creed Station (V-1.36) | 10 | 650 | 650 | 800 |
| 210A | 1.36 | | 19.47 | Creed Station (V1.36) to Cordelia Reg Station | 24,32,34,36 | 650 | 650 | 720 |
| 210A | 19.47 | | 25.62 | Cordelia Reg Station to Napa "Y' Meter Station | 10,12,24,32 | 650 | 650 | 720 |
| 210B | 0.00 | | 1.37 | Rio Vista "Y' to Creed Station (V1.37) | 16 | 800 | 800 | 800 |
| 210B | 1.37 | | 25.98 | Creed Station (V1.37) to Napa "Y" Meter Station | 16,18 | 650 | 650 | 720 |
| 210C | 19.47 | | 32.11 | Cordelia Reg Sta to Herrmann Station | 24 | 650 | 675 | 720 |

MAOP OF NUMBERED TRANSMISSION LINES

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| 210C-1 | 0.00 | | 3.76 | Valero Tap to Valero Meter Station | 18 | 650 | 720 | 675 |
| 213 | | | | Orland Field Collection System | 3,4 | 819 | 960 | 960 |
| 215 | 0.00 | | 20.05 | Oak Flat Road Meter Sta to West Ave. Reg Station | 12 | 890 | 890 | 890 |
| 220-1 | 0.00 | | 2.41 | Rio Vista 'Y" to Maine Prairie Meter and Reg Sta | 16 | 792 | 800 | 800 |
| 220 | 2.41 | | 22.01 | Maine Prairie Meter & Reg Sta to Davis Meter & Reg Sta | 10,16 | 792 | 796 | 800 |
| 220 | 22.01 | | 34.46 | Davis Meter & Reg Sta to Dunnigan-Spreckels Reg Sta | 6,8 | 500 | 500 | 800 |
| 222 | 0.00 | | 2.28 | Tracy Station to Musco Olive | 2,3 | 365 | 1040 | 1040 |
| 300 | 0.00 | | 0.47 | Panoche Station to Line 2 | 24 | 890 | 890 | 890 |
| 300A | 0.00 | | 0.64 | Colorado River to Topock Compressor Station | 30,34 | 660 (21) | 700 | 700 |
| 300A | 0.64 | | 40.87 | Topock Compressor Sta to PLS 1 A | 34,40 | 865 (22) | 867 | 890 |
| 300A | 40.87 | | 103.72 | PLS 1 A to PLS 2A | 34 | 779 (22) | 815 | 815 |
| 300A | 103.72 | | 149.65 | PLS 2A to PLS 2AX | 34 | 682 (22) | 688 | 688 |
| 300A | 149.65 | | 159.33 | PLS 2AX to Hinkley Compressor Station | 24,26,34 | 573 | 573 | 688 |
| 300A | 159.33 | | 203.02 | Hinkley Compressor Station to PLS 3A | 34 | 860 (22) | 861 | 890 |
| 300A | 203.02 | | 256.21 | PLS 3A to PLS 4A | 34 | 766 (22) | 803 | 817 |
| 300A | 256.21 | | 299.01 | PLS 4A to PLS 5A | 34 | 754 (22) | 757 | 757 |
| 300A | 299.01 | | 353.85 | PLS5A to Kettleman Compressor Station | 32,34 | 668 (22) | 669 | 688 |
| 300A | 353.85 | | 436.74 | Kettleman Compressor Station to PLS 6A | 24,34,36 | 839 (22) | 840 | 890 |
| 300A | 436.74 | | 490.65 | PLS 6A to PLS 7A | 34, 36 | 631 (33) | 631 | 631 |
| 300A | 490.65 | | 502.34 | PLS 7A to Milpitas Terminal | 34 | 555 (22) | 558 | 676 |
| 300B | 0.00 | | 0.45 | Colorado River to Topock Compressor Station | 34 | 660 | 660 | 735 |
| 300B | 0.45 | | 40.49 | Topock Compressor Station to PLS 1B | 24,34,40 | 865 (22) | 867 | 894 |
| 300B | 40.49 | | 103.51 | PLS 1 B to PLS 2B | 24,34 | 779 (22) | 821 | 821 |
| 300B | 103.51 | | 148.91 | PLS 2B to PLS 2BX | 34 | 682 (22) | 688 | 688 |
| 300B | 148.91 | | 161.02 | PLS 2BX to Hinkley Compressor Station | 34 | 573 (22) | 573 | 688 |
| 300B | 161.02 | | 203.07 | Hinkley Compressor Station to PLS 3B | 24,34,40 | 860 (22) | 861 | 897 |
| 300B | 203.07 | | 256.64 | PLS 3B to PLS 4B | 34 | 766 (22) | 803 | 816 |
| 300B | 256.64 | | 299.00 | PLS 4B to PLS 5B | 34,36 | 754 (22) | 757 | 757 |
| 300B | 299.00 | | 154.02 | PLS 5B to Kettleman | 34 | 668 (22) | 669 | 688 |
| 300B | 354.02 | | 436.85 | Kettleman Compressor Station to PLS 6B | 34 | 839 (22) | 840 | 890 |
| 300B | 436.85 | | 490.92 | PLS 6B to PLS 7B | 34,36 | 631 (33) | 631 | 631 |
| 300B | 490.92 | | 502.64 | PLS 7B to Milpitas Terminal | 34,36 | 597 (22) | 600 | 669 |
| 301A | 0.00 | | 24.84 | Hollister Meter Station to Moss Landing PP | 20 | 396 | 396 | 500 |
| 301B | 0.00 | | 13.96 | Dolan Road Meter Station to Spreckels D.R. | 12 | 408 | 408 | 408 |
| *301C | 13.87 | | 17.20 | V-13.87 to Harkins Road Meter & Reg Station | 12 | 408 | 408 | 408 |
| 301D | 0.00 | | 1.72 | Anzar Tap Station to Anzar Road Meter & Reg Station | 10 | 500 | 500 | 500 |

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| *301E | 0.00 | | 1.02 | Reservation Rd Tap to Davis-Reservation Roads Reg Sta | 12 | 408 | 408 | 408 |
| *301F | 0.00 | | 7.94 | Espinosa Road Tap Sta to 8th St & 1st Avenue Reg Sta (Fort Ord Reg Sta) | 16 | 408 | 412 | 412 |
| 301G | 0.00 | | 24.68 | Hollister Meter Station to Moss Landing PP Primary Reg Sta | 24,30 | 500 | 500 | 500 |
| 301H | 0.00 | | 1.72 | Anzar Tap Station to Anzar Road Meter & Reg Station | 16 | 500 | 500 | 500 |
| 302 | | | | Grimes Area Collection | 2-20 | 975 | 975 | 975 |
| 302W | 0.00 | | 5.76 | Hershey Junction to Buckeye Creek PLS | 20 | 975 | 975 | 975 |
| 303 | 0.00 | | 7.95 | Antioch Terminal to Brentwood Terminal | 36 | 720 | 720 | 720 |
| 303 | 7.95 | | 11.97 | Brentwood Terminal to Vasco Road | 36 | 720 (23) | 793 | 864 |
| 303 | 11.97 | | 20.44 | Vasco Road to Dalton Ave. | 36 | 720 (23) | 776 | 864 |
| 303 | 20.44 | | 25.54 | Dalton Ave. to Livermore Junction | 36 | 720 (23) | 864 | 864 |
| 303 | 25.54 | | 36.56 | Livermore Junction to Sheridan Rd PL Station | 36 | 720 | 731 | 877 |
| 303 | 36.56 | | 42.86 | Sheridan Road PL Station to Irvington Station | 36 | 590 | 590 | 877 |
| 304 | 0.00 | | 11.29 | Lathrop Dehydrator & Odorizer Sta to Tracy Sta | 12 | 825 | 825 | 825 |
| 304 | | | | Lathrop Field Collection System | 3-12 | 825 | 825 | 890 |
| 306 | 0.00 | | 40.30 | Kettleman Compressor Station to Estrella PL Station | 20 | 839 | 840 | 840 |
| 306 | 40.30 | | 70.02 | Estrella PL Station to Morro Bay PP Reg Station | 20 | 636 (26) | 650 | 840 |
| 307 | 0.00 | | 16.37 | Spreckels Sugar Meter Sta to Spreckels Sugar Reg Sta | 8 | 500 | 500 | 890 |
| 307 | 0.19 | | 2.20 | 10" parallel line between Tap 0.91 and Tap 2.20 | 10 | 500 | 890 | 890 |
| 307 | 12.05 | | 16.92 | Derrick Avenue Tap to Arbios Reg Station | 8 | 500 | 890 | 890 |
| 310 | 0.00 | | 37.57 | Tres Pinos Creek Station to BAF Cogen Facility | 10,12 | 840 | 890 | 890 |
| 311 | 0.00 | | 54.44 | Trona Tap Meter Sta to Westend Primary Reg Sta | 10,12 | 700 | 700 | 890 |
| 311 | 31.97 | | 38.49 | 12" parallel line between Tap 31.97 and Tap 38.49 | 12 | 700 | 810 | 890 |
| 312 | 0.00 | | 8.00 | Paloma to Paloma Field Meter Station | 8 | 757 | 757 | 820 |
| 313 | 0.00 | | 34.40 | Lucerne Valley Tap Meter Sta to Big Bear Meter Sta | 8,10 | 573 | 573 | 573 |
| 314 | 0.00 | | 24.19 | Hinkley Compressor Station to Riverside PLS | 12 | 861 | 861 | 890 |
| 314 | 24.19 | | 29.12 | Riverside PLS to Valve 8 at MP 29.12 | 10 | 550 | 550 | 720 |
| *314 | 29.12 | | 43.18 | Valve 8 at MP 29.12 to Black Mt. Meter and Reg Station | 8,10 | 550 | 550 | 720 |
| *314A | 0.00 | | 0.24 | Tap 24.31 to Riverside Cement Mtr & Reg Sta | 8 | 550 | 550 | 720 |
| *314B | 0.00 | | 0.08 | Tap 27.46 to Airbase Road Meter Station | 8 | 550 | 550 | 720 |
| *316 | | | | Dutch Slough Area Collection System | 2-12 | 720 | 720 | 720 |
| 316 | 0.00 | | V-13.07 | Brentwood Dehydrator Sta to V 13.07 on L-114 | 16 | 497 (4) | 720 | 720 |
| 318 | | | | Black Butte Field Collection System | 3,4,6 | 907(24) | 911 | 960 |
| 319 | 0.00 | | 9.01 | "Gosford Intertie" Kern River Sta (PG&E) to Coles Levee Reg Sta (SoCal Gas) | 34 | 754(27) | 1440 | 1440 |
| 319A | 0.00 | | 2.17 | Tap 3.58 to Renfro Reg Sta | 4 | 754(27) | 1440 | 1440 |

MAOP OF NUMBERED TRANSMISSION LINES

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| 331A | 0.00 | | 8.40 | Bayview Road Station to Ingomar Packing (Tap 8.40) | 4,6 | 890 | 890 | 890 |
| 331B | 0.00 | | 5.31 | Bayview Road Station to Morning Star, 6" Parallel | 6 | 890 | 890 | 890 |
| 339 | 0.00 | | 0.87 | Rancho Capay Field Collection System | 4 | 819 | 819 | 960 |
| 351 | 0.00 | | 14.68 | V-6.99 L-111B to T-35.92 L-138 | 16", 30" | 650 | 1040 | 1040 |
| 352 | 0.00 | | 5.50 | T-8.54 L-351 to T-18.71 L-111A | 12", 24" | 650 | 890 | 890 |
| 372 | 0.00 | | 3.70 | Ridgecrest Tap to Ridgecrest Primary Reg Station | 6 | 700 | 700 | 960 |
| 375 | 0.00 | | 6.60 | L- 1 42 Tap to V-6.6 (So. Calif. Gas L-7039 Tap) | 16 | 475 | 833 | 780 |
| 375 | 6.60 | | 17.41 | V-6.6 to PSE, Mt. Poso Cogeneration Plant | 8,12,16 | 475 | 833 | 780 |
| 375A | 0.00 | | 2.05 | Tap 9.20 to Destec Live Oak EOR Cogen | 8 | 475 | 833 | 780 |
| 375B | 0.00 | | | Tap 10.38 to Destec Double "C" EOR Cogen | 6 | 475 | 833 | 780 |
| 375C | 0.00 | | | Tap 10.91 to Destec High Sierra EOR Cogen | 6 | 475 | 833 | 780 |
| 375D | 0.00 | | | Tap 11.39 to Destec Kern Front EOR Cogen | 6 | 475 | 833 | 780 |
| 376 | 0.00 | | 1.67 | SoCal Gas L-7039 to Arco Cork Lease | 6,8,10 | 780 | 780 | 780 |
| 377 | 0.00 | | 0.58 | So. Calif. Gas Co. L-7039 to Dexzel Energy Corp Mtr & Reg St | 6 | 771 | 720 | 780 |
| 379 | 0.00 | | 3.50 | Harris Ranch Feeder | 2 | 890 | 890 | 890 |
| 400 | 0.00 | | 24.60 | California-Oregon Border to Tionesta Compressor Station | 36 | 911 | 911 | 911 |
| 400 | 24.60 | | 48.64 | Tionesta Compressor Station to Indian Springs PLS | 36 | 905(24) | 911 | 911 |
| 400 | 48.64 | | 82.33 | Indian Springs PLS to Burney Compressor Station | 36 | 881(24) | 911 | 911 |
| 400 | 82.33 | | 104.20 | Burney Compressor Station to MP 104.20 | 36 | 884(29) | 911 | 911 |
| 400 | 104.20 | | 115.26 | MP 104.20 to Shingletown PL Station | 36 | 884(29) | 915 | 942 |
| 400 | 115.26 | | 149.18 | Shingletown PL Station to Gerber Compressor Station | 26,36 | 865(24) | 911 | 911 |
| 400 | 149.18 | | 197.83 | Gerber Compressor Station to Delevan Compressor Station | 36 | 907(24) | 911 | 911 |
| 400 | 197.83 | | 233.87 | Delevan Compressor Station to Buckeye Creek PL Sta | 36 | 1040 | 1040 | 1040 |
| 400 | 233.87 | | 298.84 | Buckeye Creek PL Station to Antioch Terminal | 26,36 | 965(24) | 975 | 975 |
| 401 | 0.00 | | 24.88 | California-Oregon Border to MP 24.88 | 42 | 911 | 911 | 911 |
| 401 | 30.62 | | 48.65 | MP 30.62 to Indian Springs PLS | 36,42 | 911 | 911 | 911 |
| 401 | 48.65 | | 82.34 | Indian Springs PLS to Burney Compressor Station | 42 | 887(24) | 911 | 911 |
| 401 | 82.34 | | 97.94 | Burney Compressor Station to MP 97.94 | 42 | 884(29) | 911 | 911 |
| 401 | 97.94 | | 104.00 | MP 97.94 to MP 104.00 | --- | --- | --- | 911 |
| 401 | 104.00 | | 106.30 | MP 104.00 to MP 106.30 | --- | --- | --- | 942 |
| 401 | 106.30 | | 115.28 | MP 106.30 to Shingletown PLS | 42 | 884(29) | 942 | 942 |
| 401 | 115.28 | | 149.19 | Shingletown PLS to Gerber Compressor Station | 42 | 865(24) | 911 | 911 |
| 401 | 149.19 | | 197.84 | Gerber Compressor Station to Delevan Compressor Station | 36,42 | 907(24) | 911 | 911 |
| 401 | 197.84 | | 233.89 | Delevan Compressor Station to Buckeye Creek PLS | 42 | 1040 | 1040 | 1040 |
| 401 | 233.89 | | 317.23 | Buckeye Creek PLS to Bethany Compressor Station | 42 | 965(24) | 975 | 975 |
| 401 | 317.23 | | 427.34 | Bethany Compressor Station to Panoche Meter Station | 36 | 1040 | 1040 | 1040 |

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| 402 | 0.00 | | 38.10 | Redding-Calaveras Tap Sta to Calaveras Cement Co. | 8,10,12 | 600 | 600 | 720 |
| 403 | 0.00 | | 1.38 | Rio Vista "Y" to Creed Station | 16 | 800 (25) | 800 | 800 |
| 404 | 0.00 | | 1.64 | Tap 85.51 on L-400 to Burney Forest Products | 2,4 | 911 | 911 | 911 |

**Notes:**

A. Asterisks (*) indicate that line or sections are under 20% SMYS, but are listed for the purpose of continuity.

B. Numbered Notes

(1) The MOP of this section of L-101 and L-109 is restricted to 145 psig since they are connected to L-132 at a common header at SF Gas Load Center.

(2) This section of L-108 has a 175 psig MOP when operated in conjunction with the Pacific Paperboard Feeder.

(3) This section of L-114 has a 510 psig MOP when Block Valve 8.31 is open.

(4) This section of L-114 has a 438 psig MOP when run in conjunction with the Antioch header.

(5) This section of L-114 has a 497 psig MOP when run in conjunction of Line 114 north of Brentwood Terminal or Line 131 (500 MOP).

(6) This section of L-120 is directly tied to Sutter Buttes Field Collection System which has a MOP of 485 psig.

(7) This section of Line 131 (N/O Antioch), 131Y, 131Z, and 195Y have a 510 MOP when operated in conjunction with Line 114 (with V-8.31 is open) and 685 MOP when not.

(8) The MOP of Lines 100, 101, & 132 is reduced because these lines are connected directly to Line 109 (375 psig) at Milpitas Terminal.

(9) The MOP of L-132B is limited due to the MAOP of L-132 between Martin Reg Sta and SF Gas Load Center. However, when operated as a backfeed to L-101 through the crosstie at L-101, the MOP is 275 psig.

(10) This section of L-138A & 138B has a 800 psig MOP because of the limitation of the operating pressure Helm Junction Station piping.

(11) The MOP of Line 168 shall be 685 psig when operated in conjunction with L-131Z.

(12) The MOP of this section of L-177 is limited due to the MAOP of the 8" L-137 between Ryan Slough Reg Sta & Arcata Reg Sta.

(13) Not used.

(14) The MOP of this section of L-189 is limited due to the MAOP of L-126 between Tompkins Hill Mtr & Reg & Union St Reg Stations.

(15) The MOP of this section of line is 390 psig when V9.93 at SP3-L-191 Mtr Sta is CLOSED.

(16) The MOP of this section of L-130A,195 &196 is 685 psig when it is operated in conjunction with L-131Z.

(17) The MOP of this section of L-200 is 510 psig when it is operated in conjunction with 450 psig system.

(18) The MOP of this section of L-206 is limited due to the MAOP of L-400 at MP258.34.

(19) The MOP of this section of L-208 is limited due to the MAOP of L-304 at Lathrop Dehyd & Reg Sta.

(20) The MOP of this section of L-209 is limited due to the MAOP of L-128.

(21) When this section of L-300A is tied directly to L-300B, the MOP is limited to 660 psig.

(22) Maximum operating pressures shown for segments of L-300 A & B are due to elevation differences. The MOP listed is for MOP at the facilities supplying the various line segments.

(23) The MOP of this section of line is 720 psig if V-7.95 (Brentwood Terminal) is opened. Furthermore, Division regulation, crosstied to both L-114

| Line Number | MP | to | MP | Description | Pipe Diameter (inches) | MOP (psig) | Min. MAOP for Segment (psig) | Future Design Pressure (psig) |
|---|---|---|---|---|---|---|---|---|
| and L-303, has an MAOP of 595 psig. If it becomes necessary to feed regulation from L-303, the MAOP of L-303 becomes 595 psig. | | | | | | | | |
| (24) Maximum operating pressures shown for segments of L-400/401 are due to elevation differences. The MOP listed is for MOP at the facilities supplying the various line segments. | | | | | | | | |
| (25) The MOP of this section of line is restricted to 650 psig when operating in conjunction with 10" L-210A. | | | | | | | | |
| (26) The MOP listed is the MOP at Estrella PLS. The reduced MOP is to compensate for the hydrulic head effect cause by elevation drop in the pipeline. | | | | | | | | |
| (27) The MOP of Line 319 is 754 psig when operating in conjunction with Line 300A at Kern River Station. | | | | | | | | |
| (28) The MOP of Line 197A/B/C is limited due to the MAOP of Turner Road Feeder. | | | | | | | | |
| (29) The section of L-400/401 downstream of Burney Compressor Station has a MOP of 911 if the flowrate at Burney exceeds 1135 Mmscf/day. | | | | | | | | |
| (30) The MOP of Line 186 is based on the highest operating pressure 5 years prior to 12/17/03. Per 192.917 requirement for ERW pipe. | | | | | | | | |
| (31) The MOP is lowered to reduced pipeline risk. Do not raise the MOP without approval of the Risk Management Group. | | | | | | | | |
| (32) The MOP is lowered due to potential low frequency ERW issues. Do not raise the MOP without approval of the Risk Management Group. | | | | | | | | |
| (33) Maximum operating pressures shown for segments of L-300 A & B are due to elevation differences. The MOP listed is for MOP at the facilities supplying the various line segments. For PLS6, regulation setpoints = 620 due to downstream elevation drop. | | | | | | | | |
| (34) The MOP of this section of L-202 is limited due to the MAOP of the pipeline supply from L-124A and 124C. | | | | | | | | |
| Shaded area identifies change from previous revision. | | | | | | | | |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating less than | | Pipe Diameter | MOP | for Segment | Design Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| Area 1 (Peninsula) | | | | | | |
| | | | | | | |
| 0210-01 | | Half Moon Bay Feeder Line | 8,10,12 | 375 | 400 | 400 |
| 0215-01 | | Harbor Blvd. Feeder | 8 | 375 | 400 | 400 |
| 0211-01 | | Sanchez Feeder | 6,8 | 375 | 400 | 400 |
| 0203-01 | | Stanford Cogeneration Feeder (Cardinal Feeder) | 10 | 375 | 400 | 400 |
| 0201-01 | X | Middlefield Feeder | 8 | 120 | 124 | 175 |
| 0204-01 | | Alpine Road Feeder | 4,6 | 375/170 | 400/175 | 400/175 |
| 0205-01 | X | Walsh Road Feeder | 2,3,4,6 | 130 | 400/230 | 400/230 |
| 0206-01 | X | Haciendas Drive Feeder | 3,6 | 110 | 400 | 400 |
| 0207-01 | X | Todo Mundo Feeder | 4,6,8 | 375/125 | 400/140 | 400/175 |
| 0208-01 | | Ralston Ave. Feeder | 4,6,8 | 150 | 150 | 400 |
| 0209-01 | | Polhemus Road Feeder | 6 | 150 | 150 | 400/175 |
| 0214-01 | X | Foster City Feeder | 6,8,10 | 375/170 | 400/180 | 400/175 |
| 0217-01 | X | SRI Co-Gen Feeder | 6,8 | 375/175 | 400/175 | 400/175 |
| 0203-05 | X | Charter St | 4 | 375 | | |
| 0210-03 | X | San Mateo Rd | 2 | 375 | | |
| 0223-03 | | Millbrae Ave and Bayshore Hwy | 2 | 275 | 400 | |
| 0213-02 | | Oddstad Blvd., Pacifica (Pacifica Feeder MP 0-0.91) | 6,8 | 375 | 400 | |
| 0213-02 | | Oddstad Blvd., Pacifica (Pacifica Feeder MP0.91) | 6,8 | 90 | 90 | |
| 0220-01 | | John Daly Blvd., Daly City | 20 | 90 | 150 | |
| 0224-01 | X | San Bruno Ave (SF Airpoint) | 4,8 | 145 | 275 | |
| DREG4200 | | Marsh Road Feeder | 3,8 | 375 | 400 | 400 |
| DREG4207 | | Hayward Avenue Feeder | 8,10,24 | 375 | 400 | 400 |
| DREG4738 | X | Wellesley Feeder | 4,6 | 375 | 400 | 400 |
| DCUST5760 | X | RayChem Feeder | 3,4 | 175 | 175 | 175 |
| | | | | | | |
| Area 1 (San Francisco) | | | | | | |
| | | | | | | |
| 1401-01 | | Hunters Point Power Plant Feeder | 20 | 145 | 145 | 275 |
| 1402-01 | X | Missouri St, San Francisco | 16,24 | 145 | 145 | 275 |
| 1403-01 | X | Vermont St, San Francisco | 8 | 145 | 145 | 275 |
| 1404-01 | X | Oakdale Ave, San Francisco | 2 | 145 | 145 | 275 |
| 1405-01 | X | Woolsey St, San Francisco | 3,4 | 145 | 145 | 275 |
| 1406-01 | | Evans Ave / Phelps St, San Francisco | 2,4,12 | 145 | 145 | 275 |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating less than | | Pipe Diameter | MOP | for Segment | Design Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Area 2 (Diablo) | | | | | | |
| | | | | | | |
| 3008-01 | | Concord Feeder (Concord Meter Station to Ygnacio Valley Road) | 6,8,10,12 | 170 | 170 | 600 |
| 3017-01 | | Danville Feeder (La Casa Via to Diablo Road) | 6,8,10 | 338 | 365 | 600 |
| 3022-03 | | Discovery Bay Feeder from Bixler Road Reg to Point of Timber Regulator | 4,6,8 | 400 | 400 | 400 |
| 3022-01 | | Discovery Bay Feeder from L-57A to Secondary Stage Regulator (Bixler Road) | 3,4 | 722 | 837 | 867 |
| 3004-01 | | Foster-Wheeler Feeder (Avon Power Meter Station to Tosco Co-Gen) | 8,12 | 338 | 338 | 600 |
| 3014-01 | | Nichols Road Tap (SP3 to Nichols Road Reg Station) | 4 | 338 | 338 | 600 |
| 3012-01 | | Pittsburg Town Feeder (L-191 to Pittsburg-Antioch US Steel) | 12 | 338 | 338 | 600 |
| 3005-01 | | Tosco Oil Company Feeder (Avon Maltby Meter Station to Tosco Oil Co.) | 12 | 338 | 338 | 600 |
| 3010-01 | | Viera Avenue Feeder (Victory & Viera to Wilbur) | 8 | 338 | 338 | 600 |
| | | | | | | |
| Area 2 (East Bay) | | | | | | |
| | | | | | | |
| 0128-01 | | Port Costa Feeder | 4,6 | 315 | 338 | 600 |
| 0126-01 | | Standard Oil Feeder | 22 | 400 | 400 | 400 |
| 0122-01 | | Union Oil Tap (Cross Tie) | 12 | 400 | 400 | 400 |
| 105N-3 | | 50th Avenue Holder Feeder off Line 105 | 16, 20 | 150 | 198 | 275 |
| | | | | | | |
| Area 2 (Mission) | | | | | | |
| | | | | | | |
| 2402-01 | | Castro Valley Feeder (tap off L-105N to upstream of station at "A" & Yolo) | 12 | 250 | 250 | 500 |
| 2403-12 | | Decoto Road Feeder | 12 | 411 | 411 | 500 |
| 2405-01 | | Warm Springs Feeder | 4 | 590 | 650 | 650 |
| 2406-01 | | West Warren & Kato | 4 | 590 | 590 | 650 |
| 2408-01 | | Stanley Boulevard (Isabel Reg. Station to intersection of Stanley & First) | 8 | 160 | 160 | 650 |
| 2408-05 | | Dublin Feeder (tap off L-131 to intersection of Altamarino & Arnold) | 12,16 | 500 | 500 | 650 |
| 2408-05<br>2408-17 | | San Ramon Valley Feeder - downstream of Altamirano & Arnold | 8, 12 | 215 | 215 | 275 |
| 2408-11 | | Blackhawk Feeder (downstream of Altamarino & Arnold) | 12 | 500 | 656 | 650 |
| | | | | | | |
| Area 3 (DeAnza) | | | | | | |
| | | | | | | |
| 8806-01<br>8807-01<br>8807-02 | | Lawrence/Grant/Homestead DFM | 6, 8,10,12,16,20 | 180 | 180 | 200 |
| 8802-01 | X | El Monte (Los Altos) | 4, 6, 8 | 201 | 242 | 275 |
| 8805-03<br>8805-23<br>8805-04 | | Grant Rd., Mountain View | 10, 12, 16 | 180 | 180 | |
| 8832-01 | | Ross Dr., Sunnyvale | 2, 4, 6 | 375 | 375 | 400 |
| 8809-04 | X | Union Ave., San Jose | 10, 12 | 200 | 200 | |
| 8808-02 | X | Bascom Ave., Campbell | 6 | 200 | 200 | |
| GCUST5813 | X | Britton Ave., Sunnyvale DFM (NOP 225) | 6,10 | 400 | 400 | 720 |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating | | Pipe | | for | Design |
| | less than | | Diameter | MOP | Segment | Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| | | | | | | |
| Area 3 (Salinas) | | | | | | |
| | | | | | | |
| 1816-01 | | DFM-1; Watsonville to Santa Cruz (L-181A) | 8,10,12 | 303 | 303 | 400 |
| 1817-01 | | DFM-2; Watsonville to Rob Roy Junction (L-181B) | 10,12 | 400 | 400 | 400 |
| 1818-01 | | DFM-3; Santa Cruz to Davenport | 3,12,16 | 303 | 303 | 400 |
| 1815-15 | | DFM-4 Monterey V-18.65 to Carmel V-2.13 (Aguajito Rd Regulator Station) | 8,10 | 313 | 313 | 408 |
| 1822-01 | | DFM-6 Espinosa Rd Main from 301-B, V-3.40 | 6 | 408 | 500 | 408 |
| 1823-01 | | DFM-8 Paradise Road to Meridian Road Main | 4,6 | 500 | 500 | 500 |
| 1816-20 | | Airport Boulevard Feeder (Airport Blvd Tap to Freedom Blvd) | 6 | 300 | 400 | 400 |
| 1813-02 | | Monterey #1-MP 1.59 to Fig-Frank Streets Reg Sta (8th St/1st Ave Reg Station) | 8,10,12,16 | 313 | 313 | 408 |
| 1815-02 | | Monterey #2-Ford Ord to Fig-Frank Streets Reg Station (Aguajito Road) | 8,10,12 | 313 | 313 | 408 |
| 1815-15 | | Carmel Valley Feeder (D/S of Aguajito Road Reg Station) | 8,10 | 125 | 125 | 400 |
| 1822-01 | | Espinoza Road Feeder | 6 | 408 | 500 | 500 |
| 1823-01 | | Paradice Road Feeder | 4,6 | 500 | 500 | 500 |
| 1816-15 | | Graham Hill Road | 8,6 | 300 | 303 | 400 |
| 1816-05 | | La Selva Beech Feeder | 3,4 | 300 | 303 | 400 |
| 1817-03 | | Buena Vista / San Andreas Feeder (Watsonville) | 4,6 | 300 | 303 | 400 |
| 1819-01 | | Coward / Riverside Road Feeder | 3,4,6 | 300 | 303 | 400 |
| 1880-02 | 70 | Rogge Road Feeder | 4 | 350 | 350 | 500 |
| 1881-01 | | Laurel Drive Feeder | 8 | 350 | 350 | 500 |
| 1812-13 | X | Potter Road Feeder | 6 | 313 | 313 | 500 |
| 1869-01 | | Old Stage Feeder | 6 | 350 | 350 | 500 |
| 1805-01-02 | | 187/310 X-tie | 3,4,6,8,10 | 130 | 130 | 500 |
| 1870-01 | | San Juan Feeder (Watsonville) | 3 | 300 | 303 | 400 |
| 1816-50 | | 7th Ave., Santa Cruz | 10 | 300 | 400 | 400 |
| 1880-08 | | Chaparral St. and Natividad Rd., Salinas | 2 | 350 | 350 | 400 |
| DCUST2139 | | DFM-7 Union Carbide Main from 187, MP 17.42 | 3 | 313 | 313 | 500 |
| DCUST2139 | | Oaisis Rd (Union Carbide) | 3 | 313 | 313 | 500 |
| DREG4259 | | Pajaro Reg. Sta Feeder | 4 | 313 | 313 | 500 |
| DREG5419 | | Rustic Road Feeder (Hollister) | 4,6 | 500 | 500 | 500 |
| N/A | | Quarry Road - Granite Rock Feeder | 4 | 130 | 145 | 400 |
| N/A | | Moss Landing Feeder | 6 | 135 | 135 | 500 |
| N/A | | Buena Vista Feeder (Salinas) | 6,8 | 313 | 313 | 500 |
| | | | | | | |
| Area 3 (San Jose) | | | | | | |
| | | | | | | |
| 0801-01 | X | Tasman Dr. and Cisco Way, San Jose | 6 | 400 | 400 | 400 |
| 0804-01 | | Lafayette St., Santa Clara | 6, 8, 24 | 375 | 375 | 400 |
| 0804-03 | | Lafayette St., Santa Clara | 6, 8, 12 | 180 | 180 | |
| 0804-14, 05,08,16,10,11,12 | X | Lafayette St., Santa Clara | 2,6,8,12 | 180 | 180 | |
| 0806-01 | X | N 1st St, San Jose | 2,6 | 200 | 200 | 400 |
| 0807-01 | | W Calaveras Blvd., Milpitas | 6 | 400 | 400 | 400 |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating less than | | Pipe Diameter | MOP | for Segment | Design Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| 0809-01<br>0809-02 | | Diana Ave, Morgan Hill DFM | 2, 3, 4, 6 | 250 | 250 | 250 |
| 0805-01 | | Milpitas Terminal to PLS #7, King Road Feeder | 16,20,24,30 | 200 | 200 | 400 |
| 0810-01 | | Roop Rd., Gilroy | 6 | 120 | 120 | |
| 0812-01 | X | N King Rd. / Berryessa Rd., San Jose | 4,6,12,20,24 | 200 | 200 | 275 |
| 0813-<br>01,02,07,<br>0814-04,05 | | Blossom Hill / Cottle Roads, Alamden Expressway Feeder | 6,8,10,12 | 400 | 400 | 400 |
| 0813-<br>08,09,13 | | Blossom Hill / Cottle Roads, Alamden Expressway Feeder (d/s of Cottle & Poughkeepsie Rd Regulator Station) | 6,8, | 242 | 242 | 400 |
| 0840-01 | | Almaden Road Feeder (* 200 MOP when tied to 200 MAOP Tully Feeder) | 6 | 200* | 242 | 400 |
| 0815-01 | X | Emado Ave., San Jose | 3 | 100 | 100 | |
| 0817-01 | | Story Rd., San Jose | 8 | 200 | 200 | 400 |
| 0820-01 | | Dixon Landing Rd., Milpitas | 4,6 | 175 | 170 | 720 |
| 0821-01<br>0821-02 | X | Tully Rd / Curtner Ave / Winchester Blvd | 8,10,16,24 | 200 | 200 | 275 |
| 0822-01 | | Cochrane Rd., Morgan Hill | 2,4,6 | 320 | 320 | 320 |
| 0824-01 | | Mabury Reg Station Feeder | 10 | 600 | 600 | 669 |
| 0824-02 | X | Mabury Rd. / Taylor St., San Jose | 12 | 200 | 200 | 275 |
| 0826-01 | | Coyote Creek Golf Dr., San Jose | 2,4 | 250 | 400 | 400 |
| 0829-01 | X | Zanker Rd., San Jose | 3,4 | 170 | 175 | |
| 0832-01 | | Church Ave., Santa Clara | 3,4,6 | 335 | 335 | 335 |
| 0833-01 | | Pacheco Pass Rd, Bloomfield to Hwy 101 Feeder | 6,8,10,16 | 400 | 400 | 400 |
| 0833-02 | | Pacheco Pass Rd., Gilroy | 8, 10 | 395 | 400 | 400 |
| 0833-03 | X | Pacheco Pass Rd., Gilroy | 2 | 395 | 500 | |
| 0833-04 | X | 1st St., Gilroy | 6, 8 | 400 | 400 | 400 |
| 0834-01 | | Pacheco Pass Rd., Gilroy | 6 | 300 | 300 | |
| 0837-01 | | King Rd., San Jose | 12 | 200 | 200 | 275 |
| 0840-01 | X | Almaden Expy, San Jose (MOP reduced since tied to 0821-01 & 0821-02) | 6 | 200 | 242 | 242 |
| | | | | | | |
| Area 4 (Kern) | | | | | | |
| | | | | | | |
| 6607-01,03 | | DFM-8, L-300 A & B to US Borax & Chemical Co. Sec Reg & Mtr Sta (Boron Feeder) | 4,6,8 | 861 | 897 | 897 |
| 6607-01,02 | | DFM-8 US Borax & Chemical Co. Sec Reg & Mtr Sta to US Borax & Chemical Co (Boron Parallel). | 4,6,8 | 490 | 490 | 720 |
| 181A79(300A<br>) | | Segs III-VII Feeder, Kramer Junction | 6 | 861 | 897 | 897 |
| DREG5496 | | Ridgecrest DFM | 8 | 400 | 400 | 450 |
| | | | | | | |
| Area 4 (Fresno) | | | | | | |
| | | | | | | |
| 1208-01 | | Adams & Elm Meter & Reg Sta to So.Calif. Gas Co. (Solano-Sanger Feeder) | 8 | 263 | 263 | 400 |
| 1217-01 | | Ashlan Avenue Tap to River Rock Products (West Ashlan Feeder) | 4,6 | 400 | 593 | 720 |
| 1202-17,16 | | North Clovis Feeder (North Clovis Paralell-17) | 6,12 | 650 | 650 | 720 |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating less than | | Pipe Diameter | MOP | for Segment | Design Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| 1211-01 | | Coalinga Feeder-Amador Station to Oil City Road Station (To Shell/Chevron, Oil City Rd, Palmer Ave.) | 10 | 498 | 890 | 890 |
| 1211-03 | | Coalinga Feeder-Oil City Road Sta to 25-D (Chevron Feeder) | 8,10 | 498 | 720 | 720 |
| 1211-04 | | Coalinga Feeder - Coalinga Primary to Town Station | 6 | 498 | 890 | 890 |
| 1202-01-09,12 | X | Fresno Belt Main | 6,8,10,16 | 204 | 204 | 720 |
| 7212-01, 1201-01 | | Kerman Primary Feeder (Madera Ave Feeder) | 4 | 500 | 500 | 720 |
| 7212-01 1201-02 | | Kerman DFM to Kerman/Biola (d/s of Kerman Primary Station | 4 | 283 | 283 | 720 |
| 1202-11 | | Willow Ave from Shepard Ave to the Monte Vista Verde DRS | 12 | 204 | 720 | 720 |
| 1209-05 | | Peach and Central Feeder (Sanger Feed-Peach St.) | 6,8 | 650 | 720 | 720 |
| 1204-01 | | San Joaquin to Tranquility (Tranquility Feeder) | 3 | 650 | 800 | 900 |
| 1206-01 | | SIM CAL Chemical Co. Feeder | 6 | 650 | 650 | 720 |
| | | * Fresno Belt Main | | | | |
| Area 5 (Modesto) | | | | | | |
| | | | | | | |
| 7218-01 | | Carpenter Road Feeder (Modesto) | 4,12 | 408 | 720 | 720 |
| 7227-01 | | Claus Road Feeder | 6,8 | 408 | 720 | 720 |
| 7221-15 | | Dale Road to North Avenue Feeder (Dale Road Feeder) | 4,6,8,12 | 408 | 408 | 720 |
| 7219-01 | | Pauline Avenue Feeder | 4,6 | 408 | 408 | 720 |
| 7221-10 | | Ripon-Modesto Feeder, Stanislaus River to Modesto | 8,12,16 | 408 | 408 | 720 |
| 1603-03 1603-01 | | Riverbank Feeder (Louise Airport Ave Tap, Louise Airport Feeder) | 8,10 | 408 | 408 | 720 |
| 7216-01 | | Turlock Irrigation District Peaking Power Plant (Washington Rd DFM) | 6 | 500 | 890 | 890 |
| | | | | | | |
| Area 5 (Merced) | | | | | | |
| | | | | | | |
| 7205-01 | | DFM-2 Snelling Highway Feeder (from L-118 Tap) | 6,8 | 400 | 400 | 720 |
| 7202-01 | | DFM-3 Vinewood Avenue Feeder (from L-118 Tap) | 4 | 400 | 720 | 720 |
| 7201-01 | | DFM-4 Cressey Way Tap to Rogers Bros Packing (Cressey Way Feeder) | 4,6 | 400 | 400 | 720 |
| 7206-01 | | DFM-9 Yosemite Parkway Feeder (from L-118 Tap) | 6 | 400 | 400 | 720 |
| 7204-01 | | DFM-23 Winton Way Feeder (from L-118 Tap) | 6 | 400 | 720 | 720 |
| 7208-01 | | DFM-29 Madera Women's Prison (Road 22) Feeder (from L-118 Tap) | 4 | 400 | 400 | 720 |
| 7207-01 | | DFM-30 Mendota Biomass Feeder(Belmont Ave DFM-Mendota) (from L-307 Tap) | 4 | 500 | 890 | 890 |
| 7211-02 | | DFM-31 Road 26 to Oberti Olive (Oberti Olive DFM) | 4 | 400 | 720 | 720 |
| | | DFM-32 L-134 Tap to Kerman Primary Reg Station | 4 | 500 | 720 | 720 |
| 7203-02 | | DFM-33 (Nees Avenue Parallel) | 4 | 620 | 620 | 620 |
| 7208-02 | | DFM-34 Avenue 22 to Paul Masson Winery (Belmont Ave DFM) | 4 | 400 | 500 | 620 |
| 7205-04 | | DFM-35 Ragu Foods DFM | 8 | 400 | 400 | 400 |
| 7204-02 | | DFM-36 Bellevue Ave DFM to JR Wood Cogen | 4 | 400 | 720 | 720 |
| 7213-01 | | DFM-39 Road 17-1/2 to Certainteed | 4 | 720 | 720 | 720 |
| 7209-01 | | DFM-40 L-118 Tap to Avenue 9 to Valley Children Hospital (Briton Dane- | 8 | 720 | 720 | 720 |
| 7210-01 | | Los Banos DFM | 4, 6 | 394 | 394 | 720 |
| | | | | | | |
| Area 5 (Stockton) | | | | | | |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating less than | | Pipe Diameter | MOP | for Segment | Design Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| | | | | | | |
| 1605-01 | | DFM-05 Arch Airport Road Feeder | 6 | 412 | 720 | 720 |
| 1606-01 | | DFM-06 Carpenter Road Feeder | 6,8 | 412 | 720 | 720 |
| 1609-01 | | DFM-08 East Stockton Feeder (Miner Avenue) | 6,8 | 412 | 720 | 720 |
| 1613-01 | | DFM-12 Eight Mile Road Feeder | 6,8 | 412 | 500 | 720 |
| 1604-01 | | DFM-04 French Camp Road Feeder | 6 | 412 | 720 | 720 |
| 1611-04 | | DFM-11 Hammer Lane Feeder (Tam O'Shanter Drive & Hammer Lane) | 4, 6, 8 | 412 | 426 | 720 |
| 1608-01 | | DFM-07 Hazelton Feeder (Airport Way & Sonora St. Valve Lot to Stockton Gas Load Center) | 12 | 175 | 188 | 400 |
| 1603-03<br>1603-01 | | DFM-03 Louise Avenue Feeder | 8,10 | 408 | 408 | 720 |
| 1601-03 | | DFM-01 McArthur Road Feeder | 4, 8 | 365 | 720 | 720 |
| 1610-01 | | DFM-09 Pinchot Feeder (Ragu Foods) | 6, 8 | 412 | 720 | 720 |
| 1615-01 | | DFM-14 Ripon-Modesto Feeder, L-108 to Stanislaus River | 12 | 408 | 408 | 720 |
| 1615-04 | | DFM-14 Ripon-Modesto Feeder, L-108 to Simpson Paper Meter Lot | 12,16 | 720 | 720 | 720 |
| 1615-07 | X | DFM -106 Ripon Feeder | 3 | 408 | 408 | 720 |
| 1611-03 | | DFM-10 Swain Road Feeder | 6,8,10 | 412 | 460 | 720 |
| 1614-02 | | DFM-13 Turner Road Feeder A | 8 | 300 | 720 | 720 |
| 1614-01 | | DFM-13 Turner Road Feeder B | 4,6 | 300 | 300 | 720 |
| 1602-01 | | DFM-02 Yosemite Avenue Feeder (Airport to Pacific) | 8 | 408 | 720 | 720 |
| | | DFM-15 White Slough Feeder | 6, 8 | 412 | 720 | 720 |
| | X | DFM-101 Tracy-Heinz Feeder | 6 | 90 | 90 | 90 |
| | X | DFM-102 Tracy Feeder | 6 | 365 | 365 | 365 |
| | X | DFM-103 Banta Feeder | 4 | 365 | 365 | 720 |
| | X | DFM-104 Holly Sugar Feeder | 6, 8 | 365 | 365 | 720 |
| | X | DFM-105 Owens-Illionois Feeder | 4 | 110 | 110 | 275 |
| | X | DFM-107 Manteca Feeder | 4, 8 | 120 | 120 | 720 |
| | X | DFM-109 Roth Road Feeder | 4 | 408 | 720 | 720 |
| | X | DFM-110 Tracy Blvd Feeder | 3 | 290 | 290 | 960 |
| | X | DFM-111 Heinz Feeder | 6, 10 | 175 | 188 | 400 |
| | X | DFM-112 Pacific Paperboard Feeder | 6, 8, 10 | 175 | 175 | 400 |
| | X | DFM-113 Diamond Feeder | 4 | 412 | 720 | 720 |
| | X | DFM-114 Alpine Road Feeder | 6, 10 | 100 | 100 | 100 |
| | X | DFM-116 Valley Springs Feeder | 3 | 300 | 720 | 720 |
| | X | DFM-117 Pressed Metals Feeder | 2 | 300 | 500 | 720 |
| | X | DFM-118 Clements Feeder | 2 | 300 | 388 | 720 |
| | X | DFM-119 Jahant Road Feeder | 3, 4, 6 | 320 | 320 | 400 |
| | X | DFM -120 Galt Feeder | 4 | 412 | 535 | 720 |
| | | | | | | |
| | | | | | | |
| Area 6 (North Valley) | | | | | | |
| | | | | | | |
| 1039-01 | | DFM-1 Butte College Tap | 3,4 | 400 | 720 | 720 |
| 1032-01 | | Airport Road DFM | 6 | 500 | 720 | 720 |
| 1041-01 | | Burney Tap | 2 | 911 | 911 | 911 |
| 1013-01 | | Calaveras Cement Company Feeder | 8 | 500 | 600 | 720 |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating less than | | Pipe Diameter | MOP | for Segment | Design Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| 1021-01 | | Clear Creek Road Feeder | 4 | 500 | 720 | 720 |
| 1023-01? | | Enterprise Town Feeder | 4,6 | 500 | 600 | 720 |
| 1033-01 | | Gerber Feeder | 2 | 450 | 911 | 911 |
| 1019-01 | | Hamilton City Tap to Verschagin | 4,6 | 720 | 720 | 720 |
| | | Holly Sugar Tap | 4,6 | 575 | 720 | 720 |
| | | Louisiana Pacific Lumber Mill s/o Red Bluff | 2 | 911 | 911 | 911 |
| 1042-01 | | McArthur-Fall River Feeder | 2 | 525 | 911 | 911 |
| 1004-01 | | Orland Tap f rom L-177 to Second Stage Regulator (Orland Feeder) | 6 | 490 | 490 | 720 |
| 1017-01 | | Paradise Primary Reg to Secondary Reg (Paradise Feeder) | 8 | 400 | 720 | 720 |
| 1001-02 | | Red Bluff Feeder (formerly Line 309) | 2 | 911 | 911 | 911 |
| 1003-01 | | (Redding DFM | 6 | 500 | 600 | 720 |
| 1041-01 | | Sierra Pacific Lumber Tap (Burney Feeder) | 2 | 911 | 911 | 911 |
| 1007-01 | | Simpson Paper Mill Feeder | 6 | 500 | 600 | 720 |
| | | | | | | |
| Area 6 (Sacramento) | | | | | | |
| | | | | | | |
| 0614-05 | | 119-Elm and Traction Ave Reg Station to T-0.93 | 12 | 180 | 500 | 600 |
| 0617-08 | | 16" DFM-Madison and Kenneth to Pershing and Madison (Folsom Feeder-Pershing Avenue) | 16 | 274 | 500 | 500 |
| 0617-03 | | 16" DFM Hwy 80 to Hemlock (Folsom Feeder-Palm Avenue from Roseville Road) | 16 | 274 | 275 | 500 |
| 0613-01 | X | DFM-1 Sacramento Division Gas Load Ctr to North Sacramento Holder | 8,12 | 260 | 260 | 720 |
| 1802-01 | | DFM-2 Union Carbide Tap to Union Carbide Corp. | 8,10 | 412 | 412 | 720 |
| | | Line 108 Tap to Sacramento Blvd Regulator | 10,12,16 | 412 | 412 | 720 |
| 0610-01 | | Line 108 to Campbell Soup Company | 16 | 412 | 412 | 720 |
| 0609-01 | | Line 108 to Florin Road and Woodbine Avenue (Florin Road Tap) | 6 | 412 | 412 | 720 |
| | | Line 108 to Florin Road Primary | 6,10 | 412 | 412 | 720 |
| 0605-01 | | Line 108 to Galt Primary Regulator (New Hope Road Tap to First Street) | 4 | 490 | 490 | 720 |
| 0607-02 | | Sacramento Airport DFM (Airport DFM Reg Station to Reg Station A-40) | 2,4,6 | 425 | 425 | 720 |
| 0612-01 | | Sutterville Road to 43rd and Riverside | 6,8 | 412 | 412 | 720 |
| | | | | | | |
| Area 6 (Sierra) | | | | | | |
| | | | | | | |
| 1520-01 | | Diamond Oaks Feeder | 6 | 500 | 500 | 600 |
| 1502-01 | | District 10 DFM, Marysville | 8 | 400 | 400 | 720 |
| 1511-01 | | Feather River Boulevard | 4 | 600 | 600 | 720 |
| 1509-05 | | Greenleaf II Cogen Plant | 6 | 975 | 975 | 1000 |
| 1510-01 | | Greenleaf I Cogen Plant | 6 | 975 | 975 | 1000 |
| 1504-01/02 | X | Lincoln DFM (Nicolaus Road) | 4,6 | 274 | 274 | 600 |
| 1509-04 | | Yuba City Cogen Plant (Catalyst-Sunsweet Co Gen Plant) | 3,6,8 | 485 | 720 | 720 |
| 1503-01 | | Yuba City Underground Holder to Market St Reg Pit | 6,8 | 250 | 250 | 400 |
| 1518-01 | | Baseline Rd DFM | 4,8 | 500 | 500 | 720 |
| 1519-01 | | Rocklin Rd DFM | 6,12 | 500 | 500 | 720 |
| 1521-01 | | Grass Valley DFM | 6 | 600 | 720 | 720 |
| 1522-01 | | El Dorado Hills DFM | 6,10 | 500 | 500 | 720 |
| 1523-01 | | Twelve Bridges DFM | 8 | 500 | 720 | 720 |
| DREG8724 | | Green Valley Rd DFM | 12 | 500 | 720 | 720 |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating less than | | Pipe Diameter | MOP | for Segment | Design Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| 1518-02/03 | | Roseville Energy Park DFM | 10,24 | 500 | 720 | 720 |
| 1501-01 | | South Sutter DFM | 3,4 | 245 | 245 | 720 |
| DREG7496 | | Algodon Rd DFM | 6 | 600 | 720 | 720 |
| GCUST5809 | | Calpine-Feather River Energy Center DFM | 6 | 600 | 720 | 720 |
| 1508-01 | X | Beale AFB DFM | 4 | 395 | 395 | 600 |
| | | | | | | |
| Area 6 (Colusa) | | | | | | |
| | | | | | | |
| 0630-01 | | Colusa Meridian Feeder | 4,6 | 240 | 240 | 800 |
| 0637-01 | | DFM-1 Tap to Strain Rice Dryer | 4 | 800 | 800 | 800 |
| 0634-01<br>0634-02 | | Maxwell Feeder Main (Colusa Glenn Dryer) | 2 | 600 | 600 | 1000 |
| 0638-02 | | Naas Foods Feeder, Williams | 4 | 800 | 800 | 800 |
| 0632-01 | X | Williams Feeder Main | 3 | 180 | 180 | 180 |
| | | | | | | |
| Area 6 (Vacaville) | | | | | | |
| | | | | | | |
| 0601-01 | | American Home Foods Feeder | 2,4,6 | 720 | 720 | 720 |
| 0602-01 | | Anheuser Busch Feeder (Cordelia Rd & Hale Ranch Rd) | 6 | 650 | 650 | 720 |
| 0604-06 | | Davis St. Feeder-Mason to McNigh (3" Marshall Road) | 4 | 400 | 720 | 720 |
| 0600-02 | | Dixon Canning Company Feeder (Vaughn Rd Tap) | 4 | 720 | 720 | 800 |
| 0604-01 | | Elmira Rd. Feeder-Peabody to Shasta | 6 | 400 | 400 | 720 |
| 0604-16 | | Fairfield Feeder (10") -Scandia Road-Vaca Tap | 10 | 675 | 675 | 675 |
| 0614-17 | | Fairfield Feeder (12") -Scandia Road-Vaca Tap (L-210 Cross-Tie) | 12 | 650 | 650 | 740 |
| 0603-01 | | Fairfield Feeder (6" & 10") | 6,10 | 650 | 650 | 720 |
| 0604-01 | | Hawkins Road Feeder-Lewis Road (Hawkins-Lewis Primary to L-400) | 6 | 975 | 975 | 975 |
| 0604-01 | | Hawkins Road, Nut Tree Rd to Lewis Road (Vacaville Feeder - D/S of H-L Primary) | 8 | 400 | 400 | 720 |
| 0600-03 | | Robben Road Feeder-Tremont Tap to Dixon Meter Station | 6 | 720 | 750 | 800 |
| | | Travis to Vacaville Junction (3"-0604-24) (6"-0604-07)Vacaville 4") | 3,4,6 | 400 | 400 | 400 |
| 0604-02 | | Vacaville Feeder | 6 | 400 | 400 | 400 |
| 0604-02 | | Vacaville Feeder-Eldridge to Nut Tree Road (6" Elmira & 4" Davis) | 4,6 | 400 | 400 | 720 |
| | | Vacaville Feeder-SNRR to Elmira Road | 3,6 | 400 | 400 | 720 |
| | | Vacaville Feeder-SNRR to n/o Alamo | 6 | 400 | 400 | 720 |
| 0604-24 | | Vacaville Feeder (3") -Scandia to SNRR | 3 | 400 | 400 | 400 |
| 0604-07 | | Vacaville Feeder (6") -Scandia to SNRR | 6 | 400 | 400 | 400 |
| | | | | | | |
| | | | | | | |
| Area 6 (Woodland) | | | | | | |
| | | | | | | |
| n/a | | Gibson Feeder Main, 8" | 8 | 800 | 800 | 800 |
| 0620-01 | | Gibson Feeder Main, 6" | 6 | 500 | 500 | 800 |
| 0624-01 | | Fairfield-Knowlls Feeder | 4 | 500 | 500 | 800 |
| 0625-01 | | Hunts Feeder Main | 6 | 500 | 500 | 800 |
| 0622-01 | | Woodland Biomass Feeder | 4 | 500 | 500 | 500 |
| | | | | | | |
| Area 7 (North Bay) | | | | | | |

| | | MAOP OF DFMS OPERATING AT OR OVER 20% SMYS | | | Min. MAOP | Future |
|---|---|---|---|---|---|---|
| | Operating | | Pipe | | for | Design |
| | less than | | Diameter | MOP | Segment | Pressure |
| Route # | 20% | Description | (inches) | (psig) | (psig) | (psig) |
| | | | | | | |
| | | | | | | |
| 0407-01 | | 26" Line 21 (V-16.16) to Pine St Meter Station, V-3.16 | 8 | 450 | 500 | 675 |
| 0405-01 | | 26" Line 21 (V-16.16) to Zinfandel Reg Station (MP 19.00)(L-21 to Calistoga to Angwin) | 10 | 450 | 500 | 675 |
| 0405-01 | | Zinfandel Reg Station (MP 19.00 ) to York Creek Reg Sta (MP 21.88) | 8,10 | 250 | 250 | 675 |
| 0406-03 | | Tap to Kaiser Steel east of Napa River (Kaiser Road Tap) | 4 | 450 | 500 | 675 |
| 0401-01 /0402-01 | | Fairhills & Licoln DFMs, San Rafael | 16,12,10,8 | 175 | 175 | 275 |
| | | | | | | |
| Area 7 (North Coast) | | | | | | |
| | | | | | | |
| 1301-01 | | Cotati Feeder (Denman Flat to Cotati) | 8 | 150 | 150 | 675 |
| 1302-01 | | Madrone Station ot Cotati Station | 12 | 450 | 675 | 675 |
| 1306-01 | | Sonoma Tap Line | 6 | 450 | 500 | 675 |
| 1303 to 1305 | | Sonoma DFM (d/s Monroe Reg Station) to 5th & MacArthur (Sonoma), Mt. View, & Guerneville Rd | 8,10,12 | 200 | 200 | 275 |
| | | | | | | |
| Notes: | | | | | | |
| | | | | | | |
| A. There may be many DFMs listed that operate under 20% SMYS, but they are shown for the purpose of continuity. | | | | | | |
| GT&D will be identifying which DFMs are operating under 20% SMYS. | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Shaded area identifies change from previous revision. | | | | |
| | | | | | | |

**PURPOSE**

This drawing lists maximum set pressures for pipeline overpressure protection devices for backbone and local transmission pipelines, distribution feeder mains (DFMs), and pipe-type high pressure gas underground holders operating at or above 20% of the SMYS, (see note 4). This drawing is intended to assist Gas Transmission personnel in the operations, planning, and pipeline maintenance, repairs, and upgrades of this equipment and facilities.

**DEFINITIONS**

Maximum Set Pressure is the maximum set point that an overpressure protection device can be set at to ensure the pressure in a pipeline never exceeds: 1) the maximum allowable operating pressure plus 10 percent, ***or*** 2) the pressure that produces a hoop stress of 75% of SMYS, ***whichever is lower***. [code requirement 49CFR192.2.1(a)]

Maximum Operating Pressure (MOP) is the maximum pressure at which a gas pipeline system may be operated in accordance with the criteria established in DCS/GTS Standard D-S0430/ S4125. (See note 4.)

Maximum Allowable Operating Pressure (MAOP) is the maximum pressure at which a pipeline, pipeline segment, or component is qualified to operate in accordance with the requirements of 49 CFR Part 192. (See note 4.)

**GENERAL NOTES**

1. Types of overpressure protection devices listed in this drawing are relief valves (conventional and quick opening (QO)) and monitor valves. See CGT Standard 4125.2 for specific guidelines on where to set these devices.
2. Listed in this drawing are maximum set pressures in the “Maximum Set Pressure” column. If changes need to be made to the set pressures in this drawing a Facility or Pipeline Engineer must approve the changes. (See CGT Standard S4125.1 for the process)
3. Some critical regulators on Lines 300, 400, and 401 have been listed as a reference. The maximum set pressure for the regulators is the MOP of the piping downstream of the station.

| No | Date | Description | Dwn | Chkd | Apvd |
|---|---|---|---|---|---|
| 0 | 10/31/78 | Issue for Use (PLO) | DD | DM | JLR |
| 1 | 8/4/83 | Revised (PLO) | | | GWR |
| 2 | 9/17/99 | Revised and updated | JSV | RCB | SYC |
| 3 | 2/12/01 | Revised and updated | | | RCB |
| 4 | 5/20/03 | Revised and updated | | | RCB |
| 5 | 4/20/05 | Added definition of | | DLO | RCB |
| 6 | 3/29/06 | Revised and updated | PRH | DLO | TCT |
| 7 | 9/1/09 | Revised and updated | | | TGW |

REVISIONS

| Approved By | Job.# |
|---|---|
| DDC | Supv |
| DM | Dsgn |
| JLR | Dwn |
| | Chkd |
| | OK |
| RTA2 | |
| | |
| | Date 10-31-78 |
| | Scales |

PIPELINE DATA SHEET

**Overpressure Protection Device Settings**

***Gas Transmission & Distribution***

***Pacific Gas and Electric Company***
***San Francisco, California***

| | |
|---|---|
| Bill of Matl. | |
| Dwg List | |
| Supsds | |
| Supsd By | |
| Sheet No. A | |
| Drawing | Rev. |
| **183018** | **7** |

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**GENERAL NOTES CONTINUED**

4. MOP and MAOP values should be in alignment with drawing 086868, the “Pipeline Data Sheet, MAOP of Lines Operating at of Over 20% SMYS” that can be found at the Gas Engineering intranet website. This document can also be used as a reference for the assets to be protected by these overpressure protection devices.
5. ‘PLC’ stands for *Programmable Logic Controller.*

**CHANGES AND CORRECTIONS**

Changes and corrections should be addressed to the Supervising Engineer of the Station Engineering Facility Engineers.

**RELATED POLICY**

CGT Standard S4125.1, “Setpoints, Overpressure Protection Devices”
CGT Standard 4125.2, “Establishing Setpoints on Overpressure Protection Devices”
Drawing 086868, "Pipeline Data Sheet, MAOP of Lines Operating at of Over 20% SMYS”

| No | Date | Description | Dwn | Chkd | Apvd | Approved By |
|---|---|---|---|---|---|---|
| 0 | 10/31/78 | Issue for Use (PLO) | DD | DM | JLR | |
| 1 | 8/4/83 | Revised (PLO) | | | GWR | DDC |
| 2 | 9/17/99 | Revised and updated | JSV | RCB | SYC | DM |
| 3 | 2/12/01 | Revised and updated | | | RCB | JLR |
| 4 | 5/20/03 | Revised and updated | | | RCB | |
| 5 | 4/20/05 | Added definition of | | DLO | RCB | |
| 6 | 3/29/06 | Revised and updated | PRH | DLO | TCT | RTA2 |
| 7 | 9/1/09 | Revised and updated | | | TGW | |

REVISIONS

Job.# | Supv | Dsgn | Dwn | Chkd | OK | Date 10-31-78 | Scales

PIPELINE DATA SHEET

**Overpressure Protection Device Settings**

***Gas Transmission & Distribution***

***Pacific Gas and Electric Company***
***San Francisco, California***

Bill of Matl. | Dwg List | Supsds | Supsd By | Sheet No. B

Drawing **183018** | Rev. **7**

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# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| **BURNEY** | | | | | | | | | |
| Compressor Station | Burney | NGO | Dischg Press Control/Fall Back Press | PLC | N/A | 911/884 | 911/884 | 911 | Burney |
| Compressor Station | Burney | NGO | High Discharge Press. Shutdown | PLC | N/A | 921 | 911/884 | 911 | Burney |
| Compressor Station | Burney | NGO | Station Relief Valve | Relief(QO) | J | 940 | 911/884 | 911 | Burney |
| Compressor Station | Burney | NGO | Station Relief Valve | Relief(QO) | K | 940 | 911/884 | 911 | Burney |
| Compressor Station | Burney | NGO | Station Relief Valve | Relief(QO) | U | 940 | 911/884 | 911 | Burney |
| Pressure Limiting Station | Indian Springs | NGO | L-400, 36" MLV | Reg Bypass | 48.64 | 881 | 881 | 911 | Burney |
| Pressure Limiting Station | Indian Springs | NGO | L-400, 20" BPV | Regulator | 3 | 881 | 881 | 911 | Burney |
| Pressure Limiting Station | Indian Springs | NGO | L-400, 12" BOV | Relief | A | Deactivated - No Longer required | | | Burney |
| Pressure Limiting Station | Indian Springs | NGO | L-401, 42" MLV | Reg Bypass | 48.65 | 881 | 881 | 911 | Burney |
| Pressure Limiting Station | Indian Springs | NGO | L-401, 24" BPV | Regulator | 12 | 881 | 881 | 911 | Burney |
| Pressure Limiting Station | Indian Springs | NGO | L-401, 42" MLV | Monitor | 48.63 | Deactivated - No Longer required | | | Burney |
| Pressure Limiting Station | Shingletown | NGO | L-400, 36" MLV | Reg Bypass | 115.26 | 865 | 865 | 911 | Burney |
| Pressure Limiting Station | Shingletown | NGO | L-400, 20" BPV | Regulator | 3 | 865 | 865 | 911 | Burney |
| Pressure Limiting Station | Shingletown | NGO | L-400, 12" BOV | Relief | A | Deactivated - No Longer required | | | Burney |
| Pressure Limiting Station | Shingletown | NGO | L-401, 42" MLV | Reg Bypass | 115.28 | 865 | 865 | 911 | Burney |
| Pressure Limiting Station | Shingletown | NGO | L-401, 24" BPV | Regulator | 10 | 865 | 865 | 911 | Burney |
| Pressure Limiting Station | Shingletown | NGO | L-401, 42" MLV | Monitor | 115.27 | 875 | 865 | 911 | Burney |
| Compressor Station | Tionesta | NGO | Discharge Pressure Control | PLC | N/A | 905 | 905 | 911 | Burney |
| Compressor Station | Tionesta | NGO | High Discharge Press. Shutdown | PLC | N/A | 930 | 905 | 911 | Burney |
| Compressor Station | Tionesta | NGO | Station Relief Valve | Relief(QO) | L | 938 | 905 | 911 | Burney |
| Compressor Station | Tionesta | NGO | Station Relief Valve | Relief(QO) | M | 938 | 905 | 911 | Burney |
| Compressor Station | Tionesta | NGO | Station Relief Valve | Relief(QO) | S | 938 | 905 | 911 | Burney |
| **WILLOWS** | | | | | | | | | |
| Pressure Limiting Station | Buckeye Creek | NGO | L-400 12" BOV | Relief | A | 980 | 965 | 975 | Willows |
| Pressure Limiting Station | Buckeye Creek | NGO | L-400 20" BPV | Regulator | 3 | 965 | 965 | 975 | Willows |
| Pressure Limiting Station | Buckeye Creek | NGO | L-400 36" MLV | Reg Bypass | 233.87 | 965 | 965 | 975 | Willows |
| Pressure Limiting Station | Buckeye Creek | NGO | L-401 24" BPV | Regulator | 10 | 965 | 965 | 975 | Willows |
| Pressure Limiting Station | Buckeye Creek | NGO | L-401 42" MLV | Reg Bypass | 233.89 | 965 | 965 | 975 | Willows |
| Pressure Limiting Station | Buckeye Creek | NGO | L-401 42" MLV | Monitor | 233.88 | 975 | 965 | 975 | Willows |
| Compressor Station | Delevan | NGO | Discharge Pressure Control | PLC | N/A | 1040 | 1040 | 1040 | Willows |
| Compressor Station | Delevan | NGO | High Discharge Press. Shutdown | PLC | N/A | 1068 | 1040 | 1040 | Willows |
| Compressor Station | Delevan | NGO | High Suction Pressure ESD | PLC | N/A | 945 | 1040 | 1040 | Willows |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Compressor Station | Delevan | NGO | Station Relief Valve | Relief(QO) | O | 1078 | 1040 | 1040 | Willows |
| Compressor Station | Delevan | NGO | Station Relief Valve | Relief(QO) | P | 1078 | 1040 | 1040 | Willows |
| Compressor Station | Delevan | NGO | Station Relief Valve | Relief(QO) | R | 1078 | 1040 | 1040 | Willows |
| Compressor Station | Delevan | NGO | Station Relief Valve | Relief(QO) | S | 1078 | 1040 | 1040 | Willows |
| Compressor Station | Gerber | NGO | Discharge Pressure Control | PLC | N/A | 907 | 907 | 911 | Willows |
| Compressor Station | Gerber | NGO | High Discharge Press. Shutdown | PLC | N/A | 930 | 907 | 911 | Willows |
| Compressor Station | Gerber | NGO | High Discharge Press. ESD | PLC | N/A | 940 | 907 | 911 | Willows |
| Compressor Station | Gerber | NGO | Station Relief Valve | Relief(QO) | S | Deactivated - No Longer required | | | Willows |
| Compressor Station | Gerber | NGO | Station Relief Valve | Relief(QO) | T | Deactivated - No Longer required | | | Willows |
| Compressor Station | Gerber | NGO | Station Relief Valve | Relief(QO) | Y | Deactivated - No Longer required | | | Willows |
| Compressor Station | Gerber | NGO | L-177 from L-400/L-401 | Monitor | 21 | 829 | 819 | 819 | Willows |
| Compressor Station | Gerber | NGO | L-177 from L-400/L-401 | Monitor | 28 | 829 | 819 | 819 | Willows |
| Tap | Redding Calaveras | NGO | L-400 | Relief(QO) | H | 935 | 865 | 911 | Willows |
| Meter & Regulator Station | Johns Manville | NGO | L-209 from L-400 | Monitor | 3 | 489 | 479 | 720 | Willows |
| Meter & Regulator Station | Johns Manville | NGO | L-209 from L-400 | Monitor | 6 | 489 | 479 | 720 | Willows |
| **MERIDIAN** | | | | | | | | | |
| Station | Arbuckle | NGO | Intermediate from L-172 | Relief | 30 | 810 | 800 | 800 | Meridian |
| Station | Arbuckle | NGO | Arbuckle DFM from Intermediate | Relief | F | 210 | 200 | 200 | Meridian |
| Station | Arbuckle | NGO | Arbuckle DFM from Intermediate | Relief | H | 210 | 200 | 200 | Meridian |
| Regulator & Odor Station | Fell | NGO | L-169 to L-136 | Monitor | 21 | 560 | 550 | 550 | Meridian |
| Regulator & Odor Station | Fell | NGO | L-169 to L-136 | Monitor | 22 | 560 | 550 | 550 | Meridian |
| Junction | Hershey | NGO | L-172 from L-302 | Monitor | 2 | 810 | 800 | 800 | Meridian |
| Junction | Hershey | NGO | L-172 from L-302 | Monitor | 3 | 810 | 800 | 800 | Meridian |
| Storage Interconnect | Wild Goose Delevan | NGO | Storage metering run | Monitor | 1 | 1060 | 1040 | 1200 | Meridian |
| Storage Interconnect | Wild Goose Gridley | NGO | Storage metering run | Monitor | 6 | 830 | 800 | 800 | Meridian |
| **RIO VISTA** | | | | | | | | | |
| Compressor Station | Brannan Island | NGO | Station Relief Valve | Relief (QO) | M | Out of Service | 510 | 510 | Rio Vista |
| Station | Creed | NGO | L-210 E from L400/L401 | Monitor | 11 | 810 | 800 | 800 | Rio Vista |
| Station | Creed | NGO | L-210 W from L400/L401 | Monitor | 14 | 660 | 650 | 650 | Rio Vista |
| Station | Creed | NGO | L-210 W from L400/L401 | Monitor | 16 | 660 | 650 | 650 | Rio Vista |
| Station | Las Vinas | NGO | Jahant DFM from L-108S | Monitor | 1 | 205 | 200 | 320 | Rio Vista |
| Station | Las Vinas | NGO | L-108S from L-108N | Relief | R | Out of Service | 412 | 412 | Rio Vista |
| Station | Las Vinas | NGO | L-108S from L-196A/B | Monitor | 75 | 422 | 412 | 412 | Rio Vista |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Station | Las Vinas | NGO | L-108S from L-196A/B | Monitor | 76 | 422 | 412 | 412 | Rio Vista |
| Station | Las Vinas | NGO | L-197A/B from L-108S | Monitor | 95 | 310 | 300 | 300 | Rio Vista |
| Station | Las Vinas | NGO | L-197A/B from L-108S | Monitor | 96 | 310 | 300 | 300 | Rio Vista |
| Station | Serpa Junction | NGO | | Monitor | 64 | Deactivated - No Longer required | | | Rio Vista |
| Station | Serpa Junction | NGO | | Monitor | 69 | Deactivated - No Longer required | | | Rio Vista |
| Dehyd & Odor Station | Sherman Isl. No. 1 | NGO | L-195 from 12" SP-4 | Relief | E | Out of Service | 99 | 99 | Rio Vista |
| Meter & Regulator Station | SMUD | NGO | L-400/401 to SMUD | Monitor | 9 | 710 | 700 | 700 | Rio Vista |
| Meter & Regulator Station | SMUD | NGO | L-400/401 to SMUD | Monitor | 11 | 710 | 700 | 700 | Rio Vista |
| Meter & Regulator Station | SMUD | NGO | L-400/401 to SMUD | Monitor | 13 | 710 | 700 | 700 | Rio Vista |
| Storage Interconnect | Lodi Kirby Hills | NGO | Storage metering run | Monitor | 1 | 975 | 970 | 975 | Rio Vista |
| **LOS MEDANOS** | | | | | | | | | |
| Terminal | Antioch | CNTL | L-303 from L-400 | Monitor | 149 | 730 | 720 | 720 | Los Medanos |
| Terminal | Antioch | CNTL | L-303 from L-400 | Monitor | 151 | 730 | 720 | 720 | Los Medanos |
| Terminal | Antioch | CNTL | CCPP from L-400 | Monitor | 92 | 200 | 195 | 195 | Los Medanos |
| Terminal | Antioch | CNTL | L-191 from L-400 | Monitor | 93 | 610 | 600 | 600 | Los Medanos |
| Terminal | Antioch | CNTL | L-191 from L-400 | Monitor | 95 | 610 | 600 | 600 | Los Medanos |
| Terminal | Antioch | CNTL | L-114S from L-400 | Monitor | 172 | 507 | 497 | 497 | Los Medanos |
| Terminal | Antioch | CNTL | (Alternate) L-114S from L-400 | Monitor | 97 | 507 | 497 | 497 | Los Medanos |
| Terminal | Antioch | CNTL | (Alternate) L-114S from L-191 | Monitor | 172 | 507 | 497 | 497 | Los Medanos |
| Terminal | Antioch | CNTL | Antioch Header from L-400 | Monitor | 96 | 448 | 438 | 438 | Los Medanos |
| Terminal | Antioch | CNTL | Antioch Header from L-400 | Monitor | 97 | 448 | 438 | 438 | Los Medanos |
| Terminal | Antioch | CNTL | SP5 from Antioch Header | Monitor | 175 | 348 | 338 | 390 | Los Medanos |
| Terminal | Antioch | CNTL | CCPP from Antioch Header | Monitor | 155 | 200 | 195 | 195 | Los Medanos |
| Terminal | Antioch | CNTL | CCPP from Antioch Header | Monitor | 156 | 200 | 195 | 195 | Los Medanos |
| Terminal | Antioch | CNTL | SP5 from Antioch Header | Monitor | 158 | 348 | 338 | 390 | Los Medanos |
| Terminal | Antioch | CNTL | SP4 from Antioch Header | Monitor | 85 | 348 | 338 | 390 | Los Medanos |
| Compressor Station | Los Medanos | CNTL | Discharge Pressure Controller | Controller | N/A | 1800 | 1800 | 1800 | Los Medanos |
| Compressor Station | Los Medanos | CNTL | Station Relief Valve | Relief (QO) | F | 1975 | 1800 | 1800 | Los Medanos |
| Compressor Station | Los Medanos | CNTL | L-65 from Field | Monitor | 506 | 610 | 600 | 720 | Los Medanos |
| Compressor Station | Los Medanos | CNTL | L-65 from Field | Monitor | 507 | 610 | 600 | 720 | Los Medanos |
| Pressure Limiting Station | Los Medanos | CNTL | SP3 | Monitor | 705 | 415 | 405 | 468 | Los Medanos |
| Pressure Limiting Station | Los Medanos | CNTL | SP3 | Monitor | 706 | 415 | 405 | 468 | Los Medanos |
| Compressor Station | Pleasant Creek | CNTL | Station Relief Valve | Relief (QO) | H | 1425 | 1300 | 1440 | Los Medanos |
| Compressor Station | Pleasant Creek | CNTL | L-56 to L-206 | Monitor | 14 | 985 | 975 | 1440 | Los Medanos |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Meter Station | SP3-Line 191 | CNTL | SP-3 to L-191 | Monitor | 11 | 348 | 338 | 338 | Los Medanos |
| Meter Station | SP3-Line 191 | CNTL | SP-3 to L-191 | Monitor | 12 | 348 | 338 | 338 | Los Medanos |
| Meter Station | SP3-Line 191 | CNTL | SP-3 to L-191 | Monitor | 20 | 348 | 338 | 338 | Los Medanos |
| **MCDONALD ISLAND** | | | | | | | | | |
| Compressor Station | McDonald Island | CNTL | K-1 Compressor Suction Relief | Relief (QO) | M | 1122 | 1025 | 1025 | McDonald |
| Compressor Station | McDonald Island | CNTL | K-1 Compressor Discharge Relief | Relief (QO) | L | 2371 | 2160 | 2160 | McDonald |
| Compressor Station | McDonald Island | CNTL | K-2 Compressor Suction Relief | Relief (QO) | N | 1122 | 1025 | 1025 | McDonald |
| Compressor Station | McDonald Island | CNTL | K-2 Compressor Discharge Relief | Relief (QO) | P | 2371 | 2160 | 2160 | McDonald |
| Compressor Station | McDonald Island | CNTL | Station Relief Valve | Relief (QO) | Q | 1122 | 1025 | 1025 | McDonald |
| Compressor Station | McDonald Island | CNTL | Station Relief Valve | Relief (QO) | R | 2371 | 2160 | 2160 | McDonald |
| Compressor Station | McDonald Island | CNTL | Station Relief Valve | Relief (QO) | AA | Removed | 1025 | 1025 | McDonald |
| **TRACY** | | | | | | | | | |
| Station | Bayview Road | CNTL | L-331 from L-401 | Monitor | 12 | 980 | 890 | 890 | Tracy |
| Station | Bayview Road | CNTL | L-331 from L-401 | Monitor | 16 | 980 | 890 | 890 | Tracy |
| Compressor Station | Bethany | CNTL | Discharge Pressure Control | PLC | N/A | 1040 | 1040 | 1040 | Tracy |
| Compressor Station | Bethany | CNTL | High Discharge Pressure Shutdown | PLC | N/A | 1080 | 1040 | 1040 | Tracy |
| Compressor Station | Bethany | CNTL | Station Relief | Relief(QO) | J | 1080 | 1040 | 1040 | Tracy |
| Pressure Limiting Station | Bixler Road | CNTL | L-401 from L-57B | Monitor | 3 | 985 | 975 | 975 | Tracy |
| Pressure Limiting Station | Bixler Road | CNTL | L-401 from L-57B (Reg Leakage) | Relief | B | Removed | | | Tracy |
| Dehydrator Station | Brentwood | CNTL | L-316 from Dutch Slough Fld | Monitor | 1 | 448 | 438 | 720 | Tracy |
| Terminal | Brentwood | CNTL | L-303N from L-57A | Monitor | 72 | 730 | 720 | 720 | Tracy |
| Terminal | Brentwood | CNTL | L-303S from L-57A (Not Used) | Monitor | 83 (closed) | 730 | 720 | 793 | Tracy |
| Terminal | Brentwood | CNTL | L-303N from L-57B | Monitor | 113 | 730 | 720 | 720 | Tracy |
| Terminal | Brentwood | CNTL | L-303N from L-57B (Reg Leakage) | Relief (QO) | AC | 1051 | 960 | 1440 | Tracy |
| Terminal | Brentwood | CNTL | L-303N from L-57B (Reg Leakage) | Relief (QO) | AH | 1051 | 960 | 960 | Tracy |
| Terminal | Brentwood | CNTL | L-303S from L-57B | Monitor | 117 | 730 | 720 | 793 | Tracy |
| Terminal | Brentwood | CNTL | L-303S from L-57B (Reg Leakage) | Relief (QO) | AD | 1051 | 960 | 1440 | Tracy |
| Terminal | Brentwood | CNTL | L-303S from L-57B(Reg Leakage) | Relief (QO) | AF | 1051 | 960 | 960 | Tracy |
| Terminal | Brentwood | CNTL | L-303S from L-57B | Monitor | 126 | 730 | 720 | 793 | Tracy |
| Terminal | Brentwood | CNTL | L-303S from L-57B (Reg Leakage) | Relief (QO) | AA | 1051 | 960 | 1440 | Tracy |
| Terminal | Brentwood | CNTL | L-303S from L-57B (Reg Leakage) | Relief (QO) | AB | 1051 | 960 | 960 | Tracy |
| Terminal | Brentwood | CNTL | L-114S from L-57B | Monitor | 126 | 605 | 595 | 595 | Tracy |
| Terminal | Brentwood | CNTL | L-2 from L-57B | Monitor | 108 | 900 | 890 | 890 | Tracy |
| Terminal | Brentwood | CNTL | L-114S from L-303N | Monitor | 85 | 510 | 500 | 595 | Tracy |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Terminal | Brentwood | CNTL | L-2 from L-57B (Reg Leakage) | Relief (QO) | AE | 1051 | 960 | 1440 | Tracy |
| Station | Crows Landing | CNTL | Dist. Regulator Station | | | | 58 | 58 | Tracy |
| Station | Crows Landing | CNTL | Dist. Regulator Station | | | | 58 | 58 | Tracy |
| Station | Dos Palos | CNTL | L-186 from L-2 | Monitor | 7 | 510 | 500 | 625 | Tracy |
| Station | Dos Palos | CNTL | L-186 from L-2 | Monitor | 9 | 510 | 500 | 625 | Tracy |
| Station | Gustine | CNTL | Gustine from L-2 | Monitor | 11 | 155 | 150 | 150 | Tracy |
| Station | Gustine | CNTL | Gustine from L-2 | Monitor | 14 | 155 | 150 | 150 | Tracy |
| Station | Los Banos | CNTL | Los Banos from L-2 | Monitor | 8 | 160 | 155 | 215 | Tracy |
| Station | Los Banos | CNTL | Los Banos from L-2 | Monitor | 11 | 160 | 155 | 215 | Tracy |
| Station | MacArthur Road | CNTL | Tracy from L-2 | Monitor | 11 | 375 | 365 | 365 | Tracy |
| Station | MacArthur Road | CNTL | Tracy from L-2 | Monitor | 14 | 375 | 365 | 365 | Tracy |
| Station | New Westley Town | CNTL | New Westley from L-2 | Monitor | 15 | 140 | 135 | 135 | Tracy |
| Station | New Westley Town | CNTL | New Westley from L-2 | Monitor | 18 | 140 | 135 | 135 | Tracy |
| Station | Newman | CNTL | Newman from L-2 | Monitor | 11 | 155 | 150 | 150 | Tracy |
| Station | Newman | CNTL | Newman from L-2 | Monitor | 14 | 155 | 150 | 150 | Tracy |
| Pressure Limiting Station | Old River | CNTL | L-57A from L-57B | Monitor | 4 | 877 | 867 | 867 | Tracy |
| Pressure Limiting Station | Old River | CNTL | L-57A from L-57B (Reg Leakage) | Relief | B | Removed | | | Tracy |
| Station | Owens-Illinois Glass | CNTL | Owens from L-2 | Monitor | 7 | 115 | 110 | 125 | Tracy |
| Station | Owens-Illinois Glass | CNTL | Owens from L-2 | Monitor | 10 | 115 | 110 | 125 | Tracy |
| Station | Patterson | CNTL | Patterson from L-2 | Monitor | 11 | 260 | 250 | 395 | Tracy |
| Station | Patterson | CNTL | Patterson from L-2 | Monitor | 14 | 260 | 250 | 395 | Tracy |
| Station | Tracy | CNTL | L-107 from L-304 | Monitor | 86 | 487 | 477 | 500 | Tracy |
| Station | Tracy | CNTL | L-176 from L-162 | Relief | AB | 375 | *365 | 555 | Tracy |
| Station | Tracy | CNTL | L-176 from L-162 | Relief | AA | 375 | *365 | 555 | Tracy |
| Station | Tracy | CNTL | L-162 from L-2 | Monitor | 91 | 375 | 365 | 720 | Tracy |
| Station | Tracy | CNTL | L-107 from L-2 | Monitor | 95 | 375 | 365 | 720 | Tracy |
| | | | | *At the request of Stockton Division, NOP is 100 psig | | | | | |
| Meter Station | Vernalis | CNTL | L-108 from L-2 | Monitor | 5 | 710 | 700 | 1040 | Tracy |
| Meter Station | Vernalis | CNTL | L-108 from L-2 | Monitor | 9 | 710 | 700 | 1040 | Tracy |
| **MILPITAS** | | | | | | | | | |
| Pressure Limiting Station | 7A | CNTL | 24" BPV | Regulator | 3 | 555 | 555 | 558 | Milpitas |
| Pressure Limiting Station | 7A | CNTL | 34" MLV | Reg Bypass | 490.65A | 543 | 555 | 558 | Milpitas |
| Pressure Limiting Station | 7A | CNTL | 34" MLV | Monitor | 490.64A | 565 | 555 | 558 | Milpitas |
| Pressure Limiting Station | 7B | CNTL | 24" BPV | Regulator | 8 | 597 | 597 | 600 | Milpitas |
| Pressure Limiting Station | 7B | CNTL | 34" MLV | Reg Bypass | 490.92B | 585 | 597 | 600 | Milpitas |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Pressure Limiting Station | 7B | CNTL | 34" MLV | Monitor | 490.91B | Deactivated - No Longer required | | | Milpitas |
| Station | Irvington | CNTL | L- 105N from Mixer | Monitor | 5 | 260 | 250 | 250 | Milpitas |
| Station | Irvington | CNTL | Mixer from L- 131S | Monitor | 34 | 430 | 420 | 420 | Milpitas |
| Station | Irvington | CNTL | Mixer from L- 131 | Monitor | 50 | 430 | 420 | 420 | Milpitas |
| Station | Irvington | CNTL | Mixer from L- 107 | Monitor | 66 | 430 | 420 | 420 | Milpitas |
| Station | Irvington | CNTL | Mixer from L- 303 | Monitor | 71 | 430 | 420 | 420 | Milpitas |
| Meter Station | Lomita Park | CNTL | L-101 | Monitor | 33.68 | 150 | 145 | 145 | Milpitas |
| Meter Station | Lomita Park | CNTL | L-101 | Monitor | 24 | 150 | 145 | 145 | Milpitas |
| Regulator Station | Martin Station | CNTL | L- 132 | Monitor | 46.59 | 150 | 145 | 145 | Milpitas |
| Regulator Station | Martin Station | CNTL | L- 132 | Monitor | 12 | 150 | 145 | 145 | Milpitas |
| Terminal | Milpitas | CNTL | L-300A from Mixer | Monitor | 3 | 568 | 558 | 558 | Milpitas |
| Terminal | Milpitas | CNTL | L-300A from Mixer | Monitor | 4 | 568 | 558 | 558 | Milpitas |
| Terminal | Milpitas | CNTL | L-300B from Mixer | Monitor | 5 | 610 | 600 | 600 | Milpitas |
| Terminal | Milpitas | CNTL | L-300B from Mixer | Monitor | 6 | 610 | 600 | 600 | Milpitas |
| Terminal | Milpitas | CNTL | Mixer | Monitor | 16 | 385 | 375 | 400 | Milpitas |
| Terminal | Milpitas | CNTL | Mixer | Monitor | 20 | 385 | 375 | 400 | Milpitas |
| Terminal | Milpitas | CNTL | Mixer | Monitor | 20 | 385 | 375 | 400 | Milpitas |
| Terminal | Milpitas | CNTL | Mixer | Monitor | 26 | 385 | 375 | 400 | Milpitas |
| Terminal | Milpitas | CNTL | Mixer | Monitor | 28 | 385 | 375 | 400 | Milpitas |
| Terminal | Milpitas | CNTL | SJ DFM | Monitor | 33 | 205 | 200 | 200 | Milpitas |
| Terminal | Milpitas | CNTL | SJ DFM | Monitor | 36 | 205 | 200 | 200 | Milpitas |
| Terminal | Milpitas | CNTL | L-109 | Monitor | 37 | 385 | 375 | 400 | Milpitas |
| Terminal | Milpitas | CNTL | L-109 | Monitor | 39 | 385 | 375 | 400 | Milpitas |
| Terminal | Milpitas | CNTL | Station bypass | Monitor | 63 | 385 | 375 | 400 | Milpitas |
| Terminal | Milpitas | CNTL | L-107 | Monitor | 66 | 487 | 477 | 720 | Milpitas |
| Terminal | Milpitas | CNTL | L-107 | Monitor | 67 | 487 | 477 | 720 | Milpitas |
| Terminal | Milpitas | CNTL | L-131 | Monitor | 70 | 600 | 590 | 595 | Milpitas |
| Terminal | Milpitas | CNTL | L-131 | Monitor | 71 | 600 | 590 | 595 | Milpitas |
| Pressure Limiting Station | Sheridan Road | CNTL | L-303 24" MLV | Monitor | 3 | 600 | 590 | 590 | Milpitas |
| Pressure Limiting Station | Sheridan Road | CNTL | L-303 24" MLV | Monitor | 4 | 600 | 590 | 590 | Milpitas |
| Regulator Station | Sullivan Avenue | CNTL | L-109 | Monitor | 2 | 150 | 145 | 150 | Milpitas |
| Regulator Station | Sullivan Avenue | CNTL | L-109 | Monitor | 13 | 150 | 145 | 150 | Milpitas |
| **HOLLISTER** | | | | | | | | | |
| Pressure Limiting Station | 6A | CNTL | L-300A, 12" DS Blow Off Valve | Relief | A | 630 | 620 | 631 | Hollister |
| Pressure Limiting Station | 6A | CNTL | L-300A, 24" BPV | Regulator | 3 | 620 | 620 | 631 | Hollister |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Pressure Limiting Station | 6A | CNTL | L-300A, 34" MLV | Reg Bypass | 463.74A | 608 | 620 | 631 | Hollister |
| Pressure Limiting Station | 6B | CNTL | L-300B, 12" DS Blow Off Valve | Relief | E | 630 | 620 | 631 | Hollister |
| Pressure Limiting Station | 6B | CNTL | L-300B, 24" BPV | Regulator | 8 | 620 | 620 | 631 | Hollister |
| Pressure Limiting Station | 6B | CNTL | L-300B, 34" MLV | Reg Bypass | 463.85B | 608 | 620 | 631 | Hollister |
| Pressure Limiting Station | 6BX | CNTL | Station Relief | Relief (QO) | A | Deactivated - No Longer required | | | Hollister |
| Meter Station | Bolsa | CNTL | L-301 A&G to L-103 | Monitor | 7 | 360 | 350 | 350 | Hollister |
| Meter Station | Bolsa | CNTL | L-301 A&G to L-103 | Monitor | 8 | 360 | 350 | 350 | Hollister |
| Meter Station | Dolan Road | CNTL | L-301B from L-301G | Monitor | 19 | 418 | 408 | 408 | Hollister |
| Meter Station | Dolan Road | CNTL | L-301B from L-301G | Monitor | 20 | 418 | 408 | 408 | Hollister |
| Meter Station | Hollister | CNTL | L-301A from L-300A | Monitor | 35 | 406 | 396 | 396 | Hollister |
| Meter Station | Hollister | CNTL | L-301G from L-300A | Monitor | 26 | 510 | 500 | 500 | Hollister |
| Meter Station | Hollister | CNTL | L-301G from L-300A | Monitor | 27 | 510 | 500 | 500 | Hollister |
| Meter Station | Hollister | CNTL | L-301A from L-300A | Monitor | 28 | 406 | 396 | 396 | Hollister |
| Meter Station | Hollister | CNTL | L-301A from L-300B | Monitor | 35 | 406 | 396 | 396 | Hollister |
| Meter Station | Hollister | CNTL | L-301G from L-300B | Monitor | 26 | 510 | 500 | 500 | Hollister |
| Meter Station | Hollister | CNTL | L-301G from L-300B | Monitor | 27 | 510 | 500 | 500 | Hollister |
| Meter Station | Hollister | CNTL | L-301A from L-300B | Monitor | 28 | 406 | 396 | 396 | Hollister |
| **KETTLEMAN** | | | | | | | | | |
| Compressor Station | Kettleman | SGO | Discharge Pressure Control | PLC | N/A | 839 | 839 | 840 | Kettleman |
| Compressor Station | Kettleman | SGO | High Discharge Press. Shutdown | PLC | N/A | 849 | 839 | 840 | Kettleman |
| Compressor Station | Kettleman | SGO | Unit Relief Valves | Relief | W,X,Y | 900 | 839 | 840 | Kettleman |
| Pressure Limiting Station | 4A | SGO | L- 300A, 12" DSBOV | Relief | C | 764 | 754 | 757 | Kettleman |
| Pressure Limiting Station | 4A | SGO | L- 300A, 24" BPV | Regulator | 6 | 754 | 754 | 757 | Kettleman |
| Pressure Limiting Station | 4A | SGO | L- 300A, 34" MLV | Reg Bypass | 256.21A | 742 | 754 | 757 | Kettleman |
| Pressure Limiting Station | 4B | SGO | L- 300B, 12" DSBOV | Relief | A | 764 | 754 | 757 | Kettleman |
| Pressure Limiting Station | 4B | SGO | L- 300B, 24" BPV | Regulator | 3 | 754 | 754 | 757 | Kettleman |
| Pressure Limiting Station | 4B | SGO | L- 300B, 34" MLV | Reg Bypass | 256.64B | 742 | 754 | 757 | Kettleman |
| Pressure Limiting Station | 5A | SGO | L- 300A, 34" MLV | Reg Bypass | 299.01A | 656 | 668 | 669 | Kettleman |
| Pressure Limiting Station | 5A | SGO | L- 300A, 24" BPV | Regulator | 3 | 668 | 668 | 669 | Kettleman |
| Pressure Limiting Station | 5A | SGO | L- 300A, 34" MLV | Monitor | 299.00A | 678 | 668 | 669 | Kettleman |
| Pressure Limiting Station | 5B | SGO | L- 300B, 34" MLV | Reg Bypass | 299.00B | 656 | 668 | 669 | Kettleman |
| Pressure Limiting Station | 5B | SGO | L- 300B, 24" BPV | Regulator | 6 | 668 | 668 | 669 | Kettleman |
| Pressure Limiting Station | 5B | SGO | L- 300B, 34" MLV | Monitor | 298.99B | 678 | 668 | 669 | Kettleman |
| Tap | Bakersfield | SGO | L-142 from L-300A&B | Relief | E | 485 | 475 | 475 | Kettleman |
| Tap | Bakersfield | SGO | L-142 from L-300A&B | Relief | F | 485 | 475 | 475 | Kettleman |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Pressure Limiting Station | Estrella River | SGO | L-306 | Monitor | 4 | 646 | 636 | 650 | Kettleman |
| Pressure Limiting Station | Estrella River | SGO | L-306 to L-306 | Monitor | 8 | 646 | 636 | 650 | Kettleman |
| Pressure Limiting Station | Kettleman (A side) | SGO | L-300A, Flow North to South | Regulator | 353.90A | 664 | 664 | 669 | Kettleman |
| Pressure Limiting Station | Kettleman (A side) | SGO | L-300A, Flow North to South | Monitor | 353.85A | 674 | 664 | 669 | Kettleman |
| Pressure Limiting Station | Kettleman (B side) | SGO | L-300B, Flow North to South | Regulator | 354.02B | 664 | 664 | 669 | Kettleman |
| Pressure Limiting Station | Kettleman (B side) | SGO | L-300B, Flow North to South | Monitor | 354.01B | 674 | 664 | 669 | Kettleman |
| **L-300 NORTH PIPELINE** | | | | | | | | | |
| Station (Coalinga Prison Tap) | El Dorado Ave | SGO | L-190 to Coalinga Prison DFM | Monitor | 3 | 730 | 720 | 720 | L300-N |
| Station | Helm Tap | SGO | L-138B from L-300A | Monitor | 17 | 710 | 700 | 700 | L300-N |
| Station | Helm Tap | SGO | L-138A from L-300A | Monitor | 18 | 810 | 800 | 862 | L300-N |
| Station | Panoche | SGO | L-300B from Unocal gas field | Monitor | 27 | 849 | 839 | 840 | L300-N |
| Station | Panoche | SGO | L-300A / L-300B from L-300/L-2 | Monitor | 18 | 849 | 839 | 840 | L300-N |
| Station | Panoche | SGO | L-300A / L-300B from L-300/L-2 | Monitor | 14 | 849 | 839 | 840 | L300-N |
| Station | Panoche | SGO | L-300A / L-300B from Malin mtr sta | Monitor | 31 | 849 | 839 | 840 | L300-N |
| Meter Station | Spreckels Sugar | SGO | L-307 from L-2 | Monitor | 9 | 510 | 500 | 500 | L300-N |
| Meter Station | Spreckels Sugar | SGO | L-307 from L-2 | Monitor | 13 | 510 | 500 | 500 | L300-N |
| **HINKLEY** | | | | | | | | | |
| Compressor Station | Hinkley | SGO | Discharge Pressure Control | PLC | N/A | 860 | 860 | 861 | Hinkley |
| Compressor Station | Hinkley | SGO | High Press. Discharge Shutdown | PLC | N/A | 870 | 860 | 861 | Hinkley |
| Compressor Station | Hinkley | SGO | Unit Relief Valves | Relief | N/A | 900 | 860 | 861 | Hinkley |
| **L-300 SOUTH PIPELINE** | | | | | | | | | |
| Pressure Limiting Station | 1A | SGO | L-300A, 12" DSBOV | Relief | A | 789 | 779 | 815 | L-300 -S |
| Pressure Limiting Station | 1A | SGO | L-300A, 24" BPV | Regulator | 3 | 779 | 779 | 815 | L-300 -S |
| Pressure Limiting Station | 1A | SGO | L-300A, 34" MLV | Reg Bypass | 40.87A | 767 | 779 | 815 | L-300 -S |
| Pressure Limiting Station | 1B | SGO | L-300B, 12" DSBOV | Relief | C | 789 | 779 | 821 | L-300 -S |
| Pressure Limiting Station | 1B | SGO | L-300B, 24" BPV | Regulator | 6 | 779 | 779 | 821 | L-300 -S |
| Pressure Limiting Station | 1B | SGO | L-300B, 34" MLV | Reg Bypass | 40.49B | 767 | 779 | 821 | L-300 -S |
| Pressure Limiting Station | 2A | SGO | L-300A, 12" DSBOV | Relief | A | 692 | 682 | 688 | L-300 -S |
| Pressure Limiting Station | 2A | SGO | L- 300A, 24" BPV | Regulator | 3 | 682 | 682 | 688 | L-300 -S |
| Pressure Limiting Station | 2A | SGO | L- 300A, 34" MLV | Reg Bypass | 103.72A | 670 | 682 | 688 | L-300 -S |
| Pressure Limiting Station | 2AX | SGO | L- 300A, 34" MLV | Reg Bypass | 149.65A | 573 | 573 | 573 | L-300 -S |
| Pressure Limiting Station | 2AX | SGO | L- 300A, 34" MLV | Monitor | 149.64A | 583 | 573 | 573 | L-300 -S |
| Pressure Limiting Station | 2AX | SGO | L- 300A, 16" BPV | Regulator | 3 | 573 | 573 | 573 | L-300 -S |
| Pressure Limiting Station | 2B | SGO | L- 300B, 12" DSBOV | Relief | C | 692 | 682 | 688 | L-300 -S |
| Pressure Limiting Station | 2B | SGO | L- 300B, 24" BPV | Regulator | 6 | 682 | 682 | 688 | L-300 -S |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Pressure Limiting Station | 2B | SGO | L- 300B, 34" MLV | Reg Bypass | 103.51B | 670 | 682 | 688 | L-300 -S |
| Pressure Limiting Station | 2BX | SGO | L- 300B, 34" MLV | Reg Bypass | 148.91B | 573 | 573 | 573 | L-300 -S |
| Pressure Limiting Station | 2BX | SGO | L- 300B, 34" MLV | Monitor | 148.90B | 583 | 573 | 573 | L-300 -S |
| Pressure Limiting Station | 2BX | SGO | L- 300B, 16" BPV | Regulator | 3 | 573 | 573 | 573 | L-300 -S |
| Pressure Limiting Station | 3A | SGO | L- 300A, 34" MLV | Reg Bypass | 203.02A | 788 | 803 | 803 | L-300 -S |
| Pressure Limiting Station | 3A | SGO | L- 300A, 24" BPV | Regulator | 3 | 803 | 803 | 803 | L-300 -S |
| Pressure Limiting Station | 3A | SGO | L- 300A, 34" MLV | Monitor | 203.01A | 813 | 803 | 803 | L-300 -S |
| Pressure Limiting Station | 3B | SGO | L- 300B, 24" MLV | Reg Bypass | 203.07B | 788 | 803 | 803 | L-300 -S |
| Pressure Limiting Station | 3B | SGO | L- 300B, 20" BPV | Regulator | 21 | 803 | 803 | 803 | L-300 -S |
| Pressure Limiting Station | 3B | SGO | L- 300B, 34" MLV | Monitor | 203.06B | 813 | 803 | 803 | L-300 -S |
| Interconnect Station | KRGT/PGE Daggett | SGO | L-300B from Kern River Pipeline | Monitor | 1 | 692 | 682 | 688 | L-300 -S |
| Interconnect Station | KRGT/PGE Daggett | SGO | L-300B from Kern River Pipeline | Monitor | 2 | Deactivated - No Longer required | | | L-300 -S |
| Intertie Station | Pisgah | SGO | SCG from L-300 A & B | Monitor | 4 | Station Out of Service, No Maintenance | | | L-300 -S |
| Intertie Station | Pisgah | SGO | SCG from L-300 A & B | Relief | A | Station Out of Service, No Maintenance | | | L-300 -S |
| Meter Station | Trona Tap | SGO | L-311 from L-300A | Monitor | 14 | 710 | 700 | 700 | L-300 -S |
| Meter Station | Trona Tap | SGO | L-311 from L-300A | Monitor | 16 | 710 | 700 | 700 | L-300 -S |
| Meter Station | Airbase Road | SGO | L-314 to Victorville "B" | Monitor | 9 | 245 | 240 | 250 | L300-S |
| Meter Station | Airbase Road | SGO | L-314 to Victorville "B" | Monitor | 11 | 245 | 240 | 250 | L300-S |
| Regulator Station | Amboy | SGO | L-300A to Amboy Sec. | Monitor | 11 | 225 | 220 | 220 | L300-S |
| Regulator Station | Amboy | SGO | L-300A to Amboy Sec. | Monitor | 12 | 225 | 220 | 220 | L300-S |
| Meter Station | Barstow A Tap | SGO | L-300A to Barstow "A" | Monitor | 15 | 120 | 115 | 120 | L300-S |
| Meter Station | Barstow A Tap | SGO | L-300A to Barstow "A" | Monitor | 17 | 120 | 115 | 120 | L300-S |
| Meter Station | Barstow B Tap | SGO | L-300A to Barstow "B" | Monitor | 15 | 120 | 115 | 120 | L300-S |
| Meter Station | Barstow B Tap | SGO | L-300A to Barstow "B" | Monitor | 16 | 120 | 115 | 120 | L300-S |
| Meter Station | Barstow C Tap | SGO | L-300A to Barstow "C" | Monitor | 11 | 45 | 40 | 40 | L300-S |
| Meter Station | Barstow C Tap | SGO | L-300A to Barstow "C" | Monitor | 12 | 45 | 40 | 40 | L300-S |
| Meter Station | Barstow D Tap | SGO | L-300A to Barstow "D" | Monitor | 8 | 120 | 115 | 120 | L300-S |
| Meter Station | Barstow D Tap | SGO | L-300A to Barstow "D" | Monitor | 9 | 120 | 115 | 120 | L300-S |
| Meter Station | Daggett | SGO | L-300B to Daggett Town | Monitor | 21 | 120 | 115 | 120 | L300-S |
| Meter Station | Daggett | SGO | L-300B to Daggett Town | Monitor | 22 | 120 | 115 | 120 | L300-S |
| Regulator Station | Daggett Airport | SGO | L-300B to Daggett Airport | Monitor | 11 | 35 | 30 | 43 | L300-S |
| Regulator Station | Daggett Airport | SGO | L-300B to Daggett Airport | Monitor | 12 | 35 | 30 | 43 | L300-S |
| Meter Station | Harper Lake | SGO | L-300B to SWG | Monitor | 8 | 560 | 550 | 720 | L300-S |
| Meter Station | Harper Lake | SGO | L-300B to SWG | Monitor | 12 | 560 | 550 | 720 | L300-S |
| Station | Lucerne Valley | SGO | L-300A to L-313 | Monitor | 12 | 583 | 573 | 573 | L300-S |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Station | Lucerne Valley | SGO | L-300A to L-313 | Monitor | 14 | 583 | 573 | 573 | L300-S |
| Meter & Regulator Station | Mitsubishi /Big Bear | SGO | L-313 to SWG Big Bear "B" | Monitor | 18 | 343 | 333 | 333 | L300-S |
| Meter & Regulator Station | Mitsubishi /Big Bear | SGO | L-313 to SWG Big Bear "B" | Monitor | 22 | 343 | 333 | 333 | L300-S |
| Regulator Station | Old Woman Springs | SGO | L-313 to SWG Big Bear "A" | Monitor | 8 | 335 | 325 | 395 | L300-S |
| Regulator Station | Old Woman Springs | SGO | L-313 to SWG Big Bear "A" | Monitor | 10 | 335 | 325 | 395 | L300-S |
| Regulator Station | Oro Grande | SGO | L-314 to Oro Grande | Monitor | 14 | 125 | 120 | 125 | L300-S |
| Regulator Station | Oro Grande | SGO | L-314 to Oro Grande | Monitor | 16 | 125 | 120 | 125 | L300-S |
| Meter Station | Rabbit Springs | SGO | L-313 to SWG Vistorville "E" | Monitor | 10 | 45 | 40 | 43 | L300-S |
| Meter Station | Rabbit Springs | SGO | L-313 to SWG Vistorville "E" | Monitor | 12 | 45 | 40 | 43 | L300-S |
| Pressure Limiting Station | Riverside | SGO | L-314 to L-314 | Monitor | 8 | 560 | 550 | 550 | L300-S |
| Pressure Limiting Station | Riverside | SGO | L-314 to L-314 | Monitor | 10 | 560 | 550 | 550 | L300-S |
| Meter Station | Victorville C | SGO | L-314 to SWG Vistorville "C" | Monitor | 5 | 260 | 250 | 250 | L300-S |
| Meter Station | Victorville C | SGO | L-314 to SWG Vistorville "C" | Monitor | 9 | 260 | 250 | 250 | L300-S |
| Meter Station | Victorville G | SGO | L-314 to SWG Vistorville "G" | Relief | A | 185 | 180 | 180 | L300-S |
| Meter Station | Victorville G | SGO | L-314 to SWG Vistorville "G" | Relief | B | 185 | 180 | 180 | L300-S |
| Meter Station | Victorville G | SGO | L-314 to SWG Vistorville "G" | Relief | C | 45 | 40 | 43 | L300-S |
| Meter Station | Victorville G | SGO | L-314 to SWG Vistorville "G" | Relief | D | 45 | 40 | 43 | L300-S |
| **TOPOCK** | | | | | | | | | |
| Compressor Station | Topock | SGO | Discharge Pressure Control | PLC | N/A | 865 | 865 | 867 | Topock |
| Compressor Station | Topock | SGO | High Press. Discharge Shutdown | PLC | N/A | 875 | 865 | 867 | Topock |
| Compressor Station | Topock | SGO | Unit Relief Valves | Relief | N/A | 900 | 865 | 867 | Topock |
| Meter & Regulator Station | Needles Tap | SGO | Topock CS to SWG Needles | Monitor | 13 | 205 | 200 | 250 | Topock |
| Meter & Regulator Station | Needles Tap | SGO | Topock CS to SWG Needles | Monitor | 14 | 205 | 200 | 250 | Topock |
| **LOCAL TRANSMISSION - NORTH** | | | | | | | | | |
| Meter Station | Concord | NGO | Concord from SP3 | Monitor | 8 | 175 | 170 | 170 | Diablo/Con. |
| Meter Station | Concord | NGO | Concord from SP3 | Monitor | 9 | 175 | 170 | 170 | Diablo/Con. |
| Meter & Regulator Station | Foster-Wheeler | NGO | FW Cogen from L-2 | Monitor | 5 | 348 | 338 | 338 | Diablo/Con. |
| Meter & Regulator Station | Foster-Wheeler | NGO | FW Cogen from L-2 | Monitor | 6 | 348 | 338 | 338 | Diablo/Con. |
| Regulator Station | Reliez Station Road | NGO | 16" L-191 to 12" L-191 | Monitor | 28 | 175 | 170 | 170 | Diablo/Con. |
| Regulator Station | Reliez Station Road | NGO | 16" L-191 to 12" L-192 | Monitor | 29 | 175 | 170 | 170 | Diablo/Con. |
| Regulator Station | Reliez Station Road | NGO | 16" L-191 to Moraga DFM | Monitor | 32 | 175 | 170 | 170 | Diablo/Con. |
| Regulator Station | Reliez Station Road | NGO | 16" L-191 to Moraga DFM | Monitor | 33 | 175 | 170 | 170 | Diablo/Con. |
| Meter Station | Vine Hill | NGO | Concord/PH from SP3 | Monitor | 10 | 175 | 170 | 170 | Diablo/Con. |
| Meter Station | Vine Hill | NGO | Concord/PH from SP3 | Monitor | 11 | 175 | 170 | 170 | Diablo/Con. |
| Station | Crockett | NGO | C&H Sugar Tap From L-105B/21H | Monitor | 3 | 260 | 250 | 250 | East Bay-N |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Station | Crockett | NGO | C&H Sugar Tap From L-105B/21H | Monitor | 4 | 260 | 250 | 250 | East Bay-N |
| Station | Crockett | NGO | Crockett town tap from L-105B/21H | Monitor | 11 | 260 | 250 | 250 | East Bay-N |
| Station | Crockett | NGO | Crockett town tap from L-105B/21H | Monitor | 12 | 260 | 250 | 250 | East Bay-N |
| Station | Franklin Canyon | NGO | SP3 | Monitor | 8 | 260 | 250 | 250 | East Bay-N |
| Station | Franklin Canyon | NGO | SP3 | Monitor | 9 | 260 | 250 | 250 | East Bay-N |
| Station | Franklin Canyon | NGO | SP3 | Monitor | 10 | 260 | 250 | 250 | East Bay-N |
| Regulator Station | Port Costa | NGO | Port Costa Mtr Sta from SP3 | Monitor | 5 | 325 | 315 | 338 | East Bay-N |
| Regulator Station | Port Costa | NGO | Port Costa Mtr Sta from SP3 | Monitor | 6 | 325 | 315 | 338 | East Bay-N |
| Station | San Pablo | NGO | L-105A from L-105B | Monitor | 14 | 155 | 150 | 198 | East Bay-N |
| Station | San Pablo | NGO | SP-From L-105B | Monitor | 1 | 155 | 150 | 150 | East Bay-N |
| Pressure Limiting Station | Oakland | NGO | L-153 to L-105 N | Monitor | 22 | 155 | 150 | 198 | East Bay-S |
| Station | Fairway Ave. Crossover | NGO | L-105N from L-153 | Monitor | 2 | 155 | 150 | 198 | Mission |
| Station | Marina Blvd | NGO | L-153 Oakland from L-153 Irvington | Monitor | V18.00 | 251 | 246 | 246 | Mission |
| Meter & Regulator Station | Santa Rita Road | NGO | L-131 to Pleasanton DFM | Monitor | 3 | 165 | 160 | 160 | Mission |
| Meter & Regulator Station | Santa Rita Road | NGO | L-131 to Pleasanton DFM | Monitor | 4 | 165 | 160 | 160 | Mission |
| Station | Herrmann | NGO | L-210 to 24" L-21 | Monitor | 32.11 | 415 | 405 | 675 | North Bay |
| Station | Herrmann | NGO | L-210 to 16" L-21 | Monitor | 2 | 260 | 250 | 375 | North Bay |
| Meter Station | Napa "Y' | NGO | L-210 to L-21 | Monitor | 25.98 | 460 | 450 | 450 | North Bay |
| Meter Station | Napa "Y' | NGO | L-210 to L-21 | Monitor | 5 | 460 | 450 | 450 | North Bay |
| Meter Station | Napa "Y' | NGO | L-210 to L-21 | Monitor | 9 | 260 | 250 | 275 | North Bay |
| Meter Station | Napa "Y' | NGO | L-210 to Napa DFM | Monitor | 71 | 155 | 150 | 150 | North Bay |
| Meter Station | Napa "Y" | NGO | L-210 to Napa DFM | Monitor | 79 | 155 | 150 | 150 | North Bay |
| Holder | San Rafael | NGO | L-21 to DFM 12-0401-01 | Monitor | 50 | 180 | 175 | 175 | North Bay |
| Holder | San Rafael | NGO | L-21 to DFM 12-0402-01 | Monitor | 52 | 180 | 175 | 175 | North Bay |
| Station | Vallejo | NGO | L-21 to Benicia DFM | Monitor | 33 | 185 | 175 | 175 | North Bay |
| Station | Vallejo | NGO | L-21 to Benicia DFM | Monitor | 34 | 185 | 175 | 175 | North Bay |
| Station | Arcata | NGO | Dist. Regulator Station | Monitor | 22 | | 40 | 40 | North Coast |
| Station | Arcata | NGO | Dist. Regulator Station | Monitor | 24 | | 40 | 40 | North Coast |
| Regulator Station | Arcata | NGO | L-137B to L-137C | Monitor | 20 | 172 | 167 | 167 | North Coast |
| Regulator Station | Arcata | NGO | L-137B to L-137D | Monitor | 27 | 260 | 250 | 250 | North Coast |
| Regulator Station | Arcata | NGO | L-137B to L-137D | Monitor | 30 | 260 | 250 | 250 | North Coast |
| Pressure Limiting Station | Cummings Creek | NGO | L-177(Ryan Slough) from L-177 (Gerber) | Monitor | 7 | 440 | 430 | 430 | North Coast |
| Pressure Limiting Station | Cummings Creek | NGO | L-177(Ryan Slough) from L-177 (Gerber) | Monitor | 8 | 440 | 430 | 430 | North Coast |
| Regulator Station | Elk River Road | NGO | L-177 to L-126C | Monitor | 14 | 172 | 167 | 167 | North Coast |
| Regulator Station | Elk River Road | NGO | L-177 to L-126C | Monitor | 15 | 172 | 167 | 167 | North Coast |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Regulator Station | Ryan Slough | NGO | L-177 to L-137A & L-137C | Monitor | 13 | 172 | 167 | 167 | North Coast |
| Regulator Station | Ryan Slough | NGO | L-177 to L-137A & L-137C | Monitor | 15 | 172 | 167 | 167 | North Coast |
| Compressor Station | Santa Rosa | NGO | L-21 to Crockett from L-21 Willits | Monitor | 6 | Removed | | | North Coast |
| Compressor Station | Santa Rosa | NGO | Discharge Pressure Control (K-1) | PLC | N/A | 710 | 720 | 720 | North Coast |
| Compressor Station | Santa Rosa | NGO | Discharge Pressure Control (K-2) | PLC | N/A | 710 | 720 | 720 | North Coast |
| Meter & Regulator Station | Tompkins Hill | NGO | 77(Ryan Slough) from L-177 (Cummings | Monitor | 7 | 360 | 350 | 425 | North Coast |
| Meter & Regulator Station | Tompkins Hill | NGO | 77(Ryan Slough) from L-177 (Cummings | Monitor | 8 | 360 | 350 | 425 | North Coast |
| Meter & Regulator Station | Tompkins Hill | NGO | Distribution Lines from Mixed Gas | Monitor | 61 | 175 | 170 | 170 | North Coast |
| Meter & Regulator Station | Tompkins Hill | NGO | Distribution Lines from Mixed Gas | Monitor | 62 | 175 | 170 | 170 | North Coast |
| Meter & Regulator Station | Tompkins Hill | NGO | L-177 from 4" & 6" L-125 | Monitor | 70 | 360 | 350 | 425 | North Coast |
| Meter & Regulator Station | Tompkins Hill | NGO | L-177 from 4" & 6" L-125 | Monitor | 71 | 360 | 350 | 425 | North Coast |
| Station | Union Street (Eureka) | NGO | Dist. Regulator Station | Monitor | 25 | | 50 | 50 | North Coast |
| Station | Union Street (Eureka) | NGO | Lines 126 to Line 126 | Monitor | 24 | 172 | 167 | 167 | North Coast |
| Regulator Station | U.S. 101 & Old Rdwd Hwy | NGO | L-21 to Cotati DFM | Monitor | 19 | 155 | 150 | 150 | North Coast |
| Regulator Station | U.S. 101 & Old Rdwd Hwy | NGO | L-21 to Cotati DFM | Monitor | 20 | 155 | 150 | 150 | North Coast |
| Regulator Station | Monroe | 7 | L-21C to DFM (1304-01, 1305-01) | Monitor | 20 | 200 | 200 | 200 | North Coast |
| Regulator Station | Monroe | 7 | L-21C to DFM (1304-01, 1305-01) | Monitor | 21 | 200 | 200 | 200 | North Coast |
| Regulator Station | Grape Way | NGO | Line 177 to Line 177 | Monitor | 4 | 479 | 469 | 469 | North Valley |
| Regulator Station | Grape Way | NGO | L-177 to L-177 | Monitor | 9 | 479 | 469 | 469 | North Valley |
| Station | Gridley Junction | NGO | L-167 to L-50 | Monitor | 13 | 260 | 250 | 250 | North Valley |
| Station | Gridley Junction | NGO | L-167 to L-51 | Monitor | 17 | 260 | 250 | 250 | North Valley |
| Regulator Station | Jacinto | NGO | L-128 to Artois DFM | Monitor | 25 | 205 | 200 | 200 | North Valley |
| Regulator Station | Jacinto | NGO | L-128 to Artois DFM | Monitor | 29 | 205 | 200 | 200 | North Valley |
| Tap | Redding Calaveras | NGO | Calaveras Cement from L-400/401 | Monitor | 8 | 610 | 600 | 600 | North Valley |
| Tap | Redding Calaveras | NGO | Calaveras Cement from L-400/401 | Monitor | 10 | 610 | 600 | 600 | North Valley |
| Meter Station | Richvale "Y" | NGO | L-50 (S) from L-50 (N) | Monitor | 38 | 260 | 250 | 250 | North Valley |
| Meter Station | Richvale "Y" | NGO | Oroville DFM from L-50 (S) | Monitor | 24 | 240 | 235 | 235 | North Valley |
| Meter Station | Richvale "Y" | NGO | Oroville DFM from L-50 (N) | Monitor | 28 | 240 | 235 | 235 | North Valley |
| Regulator Station | Pleasant Creek Line 159 | NGO | L-159 to L-159 | Monitor | 5 | 730 | 720 | 750 | Sacramento |
| Regulator Station | Pleasant Creek Line 159 | NGO | L-159 to L-160 | Monitor | 9 | 730 | 720 | 750 | Sacramento |
| Meter Station | Antelope | NGO | L-123 to Roseville DFM | Monitor | 25 | 185 | 180 | 180 | Sacramento |
| Meter Station | Antelope | NGO | L-123 to Roseville DFM | Monitor | 27 | 185 | 180 | 180 | Sacramento |
| Meter & Regulator Station | Davis | NGO | L-150 to L-116 | Monitor | 105 | 510 | 500 | 500 | Sacramento |
| Meter & Regulator Station | Davis | NGO | L-116 to Davis DFM | Monitor | 89 | 180 | 175 | 175 | Sacramento |
| Meter & Regulator Station | Davis | NGO | L-116 to Davis DFM | Monitor | 90 | 180 | 175 | 175 | Sacramento |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Crosstie | Line 172/220 | NGO | L-172 to L-220 | Monitor | 5 | 510 | 500 | 500 | Sacramento |
| Crosstie | Line 172/220 | NGO | L-172 to L-221 | Monitor | 6 | 510 | 500 | 500 | Sacramento |
| Regulator Station | Roseville Road | NGO | 12" L-119 to Folsom DFM | Monitor | 22 | 284 | 274 | 274 | Sacramento |
| Regulator Station | Roseville Road | NGO | 12" L-119 to Sacto DFM | Monitor | 66 | 155 | 150 | 150 | Sacramento |
| Regulator Station | Roseville Road | NGO | 16" L-119 to Folsom DFM | Monitor | 70 | 284 | 274 | 274 | Sacramento |
| Gas Load Center | Sacramento | NGO | Dist. Regulator Station | Monitor | 31 | | | | Sacramento |
| Gas Load Center | Sacramento | NGO | Dist. Regulator Station | Monitor | 35 | | | | Sacramento |
| Gas Load Center | Sacramento | NGO | L-116 to North Sac. DFM | Monitor | 16 | 270 | 260 | 260 | Sacramento |
| Gas Load Center | Sacramento | NGO | L-116 to North Sac. DFM | Monitor | 20 | 270 | 260 | 260 | Sacramento |
| Gas Load Center | Sacramento | NGO | L-172 to L-108 | Monitor | 3 | 422 | 412 | 412 | Sacramento |
| Gas Load Center | Sacramento | NGO | L-172 to L-108 | Monitor | 5 | 422 | 412 | 412 | Sacramento |
| Gas Load Center | Sacramento | NGO | L-172 to L-108 | Monitor | 7 | 422 | 412 | 412 | Sacramento |
| Meter & Regulator Station | Swingle Junction | NGO | L-172 to L-116/119 | Monitor | 21 | 730 | 720 | 720 | Sacramento |
| Meter & Regulator Station | Swingle Junction | NGO | L-122 to L-116/119 | Monitor | 29 | 730 | 720 | 720 | Sacramento |
| Meter & Regulator Station | Swingle Junction | NGO | L-172 to L-116/172 | Monitor | 52 | 510 | 500 | 500 | Sacramento |
| Meter & Regulator Station | Swingle Junction | NGO | L-172 to L-116/172 | Monitor | 53 | 510 | 500 | 500 | Sacramento |
| Meter Station | Camp Far West | NGO | L-124 to l-124 | Monitor | 7 | 95 | 90 | 400 | Sierra |
| Meter Station | Camp Far West | NGO | L-124 to l-124 | Monitor | 11 | 95 | 90 | 400 | Sierra |
| Regulator Station | Lincoln Junction | NGO | L-124 to L-123 | Monitor | 16 | 510 | 500 | 500 | Sierra |
| Regulator Station | Lincoln Junction | NGO | L-124 to Lincoln DFM | Monitor | 21 | 105 | 100 | 100 | Sierra |
| Regulator Station | Lincoln Junction | NGO | L-124 to Lincoln DFM | Monitor | 22 | 105 | 100 | 100 | Sierra |
| Underground Holder | North Sacramento | NGO | Sacto Load Center to Sacto DFM | Monitor | 93 | 185 | 180 | 180 | Sierra |
| Underground Holder | North Sacramento | NGO | Sacto Load Center to Sacto DFM | Monitor | 137 | 185 | 180 | 180 | Sierra |
| Underground Holder | North Sacramento | NGO | Sacto Load Center to Sacto DFM | Monitor | 167 | 185 | 180 | 180 | Sierra |
| Underground Holder | Yuba City | NGO | To Yuba City DFM & L-50 | Monitor | 6 | 260 | 250 | 250 | Sierra |
| Underground Holder | Yuba City | NGO | Holder to L-50S | Monitor | 25 | 410 | 400 | 400 | Sierra |
| Underground Holder | Yuba City | NGO | L-121 to L-50S | Monitor | 52 | 410 | 400 | 400 | Sierra |
| Underground Holder | Yuba City | NGO | L-167 to L-124 | Monitor | 53 | 610 | 600 | 600 | Sierra |
| Underground Holder | Yuba City | NGO | Holder relief | Relief | D | 535 | 525 | 525 | Sierra |
| Underground Holder | Yuba City | NGO | Holder Relief | Relief | E | 535 | 525 | 525 | Sierra |
| Underground Holder | Yuba City | NGO | L-121 to L-50S | Relief | P | 410 | 400 | 400 | Sierra |
| Pressure Limiting Station | Brandt Road | NGO | L-197A to L-197A | Regulator | 6 | Deactivated - No Longer required | 300 | 720 | Stockton |
| Pressure Limiting Station | Brandt Road | NGO | L-197A to L-197A | Monitor | 5 | Deactivated - No Longer required | 300 | 720 | Stockton |
| **LOCAL TRANSMISSION - SOUTH** | | | | | | | | | |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Meter Station | Gosford Road | SGO | L-142S from L-300B | Monitor | 5 | 610 | 600 | 600 | Bakersfield |
| Meter Station | Gosford Road | SGO | L-142S from L-300B | Monitor | 9 | 610 | 600 | 600 | Bakersfield |
| Station | Anzar | SGO | Dist. Regulator Station | | | | 30 | 30 | Central Coast |
| Station | Anzar | SGO | Dist. Regulator Station | | | | 30 | 30 | Central Coast |
| Regulator Station | California St. | SGO | L-103 to L-103 | Monitor | 2 | 323 | 313 | 313 | Central Coast |
| Primary Regulator Station | Harkins Rd. | SGO | L-301C to L-187 | Monitor | 7 | 323 | 313 | 313 | Central Coast |
| Regulator Station | Harkins Rd. | SGO | L-301C to L-187 | Monitor | 6 | 323 | 313 | 313 | Central Coast |
| Primary Regulator Station | King City | SGO | L-187 to King City DFM | Monitor | 3 | 135 | 130 | 130 | Central Coast |
| Regulator Station | Metz Road | SGO | L-310 to KC DFM (1st stage) | Monitor | 10 | 330 | 320 | 320 | Central Coast |
| Regulator Station | Metz Road | SGO | L-310 to KC DFM (1st stage) | Monitor | 11 | 330 | 320 | 320 | Central Coast |
| Regulator Station | Metz Road | SGO | L-310 to KC DFM (2nd stage) | Monitor | 21 | 135 | 130 | 130 | Central Coast |
| Primary Regulator Station | Moss Landing PP | SGO | Power Plant | Monitor | 1 | 140 | 135 | 275 | Central Coast |
| Primary Regulator Station | Moss Landing PP | SGO | Power Plant | Monitor | 2 | 140 | 135 | 275 | Central Coast |
| Primary Regulator Station | Moss Landing PP | SGO | Power Plant | Monitor | 4 | 140 | 135 | 275 | Central Coast |
| Primary Regulator Station | Moss Landing PP | SGO | Power Plant | Monitor | 5 | 140 | 135 | 275 | Central Coast |
| Primary Regulator Station | Moss Landing PP | SGO | Power Plant | Monitor | M | 143 | 135 | 275 | Central Coast |
| Pressure Limiting Station | Rob Roy Junction | SGO | DFM -2 to DFM -1 | Monitor | 14 | 313 | 303 | 303 | Central Coast |
| Pressure Limiting Station | Rob Roy Junction | SGO | DMF -2 to DFM -1 | Monitor | 15 | 313 | 303 | 303 | Central Coast |
| Regulator Station | San Juan Rd. | SGO | L-181A to L-181A | Monitor | 12 | 313 | 303 | 303 | Central Coast |
| Regulator Station | San Juan Rd. | SGO | L-181A to L-181A | Monitor | 7 | 313 | 303 | 303 | Central Coast |
| Underground Holder | Santa Cruz | SGO | Holder Relief | Relief | B | 375 | 618 | 618 | Central Coast |
| Underground Holder | Santa Cruz | SGO | Holder Relief | Relief | C | 674 | 618 | 618 | Central Coast |
| Station | Adams and Elm | SGO | L-138 to SCG DFM | Relief | E | 264 | 254 | 254 | Fresno |
| Station | Adams and Elm | SGO | Dist. Regulator Station | Relief | F | | 53 | 53 | Fresno |
| Regulator Station | Chestnut & Clay | SGO | L-138 to Belt Main | Monitor | 10 | 168 | 163 | 163 | Fresno |
| Tap | Coalinga | SGO | L-164 from L-300A | Monitor | 14 | 508 | 498 | 498 | Fresno |
| Tap | Coalinga | SGO | L-164 from L-300A | Monitor | 16 | 508 | 498 | 498 | Fresno |
| Station | Elkhorn | SGO | L- 138 | Monitor | 3 | 660 | 650 | 650 | Fresno |
| Station | Elkhorn | SGO | L- 138 | Monitor | 4 | 660 | 650 | 650 | Fresno |
| Gas Load Center | Fresno | SGO | L-138 to L-118 & L-111 | Monitor | 107 | 410 | 400 | 400 | Fresno |
| Gas Load Center | Fresno | SGO | Header to Belt Main | Monitor | 19 | 168 | 163 | 163 | Fresno |
| Junction | Fresno | SGO | L- 118 from L-111S | Monitor | 4 | 410 | 400 | 400 | Fresno |
| Meter & Regulator Station | Helm Junction | SGO | L-111 N from L-138A | Monitor | 9 | 660 | 650 | 650 | Fresno |
| Meter & Regulator Station | Helm Junction | SGO | L-111 N from L-138A | Monitor | 10 | 660 | 650 | 650 | Fresno |
| Station | Herndon Junction | SGO | L-134 to L-118 | Monitor | 1 | 410 | 400 | 400 | Fresno |

# GT OVERPRESSURE PROTECTION DEVICE SETTINGS - DRAWING 183018

| DISTRICT / LOCAL TRANSMISSION FACILITY TYPE | LOCATION | AREA | SYSTEM DESCRIPTION | TYPE OF DEVICE | VALVE | MAXIMUM SET PRESSURE | MOP | MAOP | DISTRICT / DIVISION |
|---|---|---|---|---|---|---|---|---|---|
| Station | Tarpey | SGO | 650 System to 163 System | Monitor | 7 | 168 | 163 | 163 | Fresno |
| Station | Tarpey | SGO | 651 System to 163 System | Monitor | 8 | 168 | 163 | 163 | Fresno |
| Regulator Station | SEGs 3 & 4 Primary | SGO | L-300B to SEGs 3 & 4 | Monitor | 10 | 420 | 410 | 861 | Kern |
| Regulator Station | SEGs 5-7 Primary | SGO | L-300B to SEGs 5-7 Sec. | Monitor | 11 | 360 | 350 | 350 | Kern |
| Regulator Station | SEGs Barstow G Primary | SGO | L-300B to SEGs 1 & 2 | Monitor | 6 | 310 | 300 | 300 | Kern |
| Regulator Station | SEGs Barstow G Primary | SGO | L-300B to SEGs 1 & 3 | Monitor | 7 | 310 | 300 | 300 | Kern |
| Station | Tully | SGO | Tully DFM from L-100 | Monitor | 4 | 205 | 200 | 200 | San Jose |
| Station | Tully | SGO | Tully DFM from L-100 | Monitor | 5 | 205 | 200 | 200 | San Jose |
| Station | Tully | SGO | Tully DFM from L-300B | Monitor | 10 | 205 | 200 | 200 | San Jose |
| Regulator Station | Coffee and Claratina | SGO | 408 System to 260 System | Monitor | 28 | 270 | 260 | 260 | Yosemite |
| Regulator Station | Coffee and Claratina | SGO | 408 System to 260 System | Monitor | 29 | 270 | 260 | 260 | Yosemite |
| Regulator Station | Coffee and Claratina | SGO | 408 System to 180 System | Monitor | 26 | 185 | 180 | 180 | Yosemite |
| Regulator Station | Coffee and Claratina | SGO | 408 System to 180 System | Monitor | 27 | 185 | 180 | 180 | Yosemite |
| Regulator Station | De Francisco | SGO | De Francisco from L-2 | Monitor | 3 | 630 | 620 | 620 | Yosemite |
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**Date:** **File #:**

**To:** VARIOUS

**From:** GAS DESIGN AND PLANNING

**Subject:** Local Gas Transmission System Operating Guide

Pacific Gas and Electric Company

ALL:

The Local Gas Transmission System Operating Guide for 2009-10 has been updated and is now available online at http://wss/ge/sites/GasDesignPlanning/gtransplanning/ under Winter Planning, Transmission Operating Guide. This material is the basis for the transmission planning presentations that are being given at the Area Winter Plan Meetings. The Guide integrates facilities design assumptions with operating procedures and was developed as an operating tool. The contents of the Guide are as follows:

1. Contact Lists
2. System Descriptions
3. Design Criteria SCADA Alarms and Design Temperatures
4. Recommended Operating Procedures
5. Local Capacity Curtailment Process

Appendix A - LNG Cold Weather Callout Plans
Appendix B - Emergency Operations Plan - Morrison Creek Cross-tie Valve

The Guide was produced by the Local Transmission System Engineers in Gas Engineering, Gas Design and Planning. Please feel free to contact the engineer responsible for the specific area if you have questions about the local system or have questions about the Guide itself.

Thank you,

Daven Phelan
Gas Design & Planning
737-3298

# Distribution List

| ELECTRONIC COPIES | | |
|---|---|---|
| **Organization** | **Description** | **E-mail Distribution List** |
| E&O, GT&D, Gas System Operations | Operations Planning and Control | GT&D GSO Gas Control; GT&D GSO Gas Control Center at Brentwood |
| E&O, GT&D, GE, Gas Design & Planning | Pipeline Engineers | GT&D GE GDP Pipeline Engineering |
| ED, M&C, Gas Transmission | District Superintendents | ED M&C GT Leadership Team |
| ED, M&C, Organized by Area | Operating Supervisors | OMC Gas T&R |
| E&O, GT&D, GE, Gas Design & Planning | Transmission System Planning & Gas Planning Support | GT&D GE GDP TSP&GPS Engineers |
| E&O, GT&D, GE, Gas Design & Planning | Sr. Gas Engineers | GT&D GE GDP Dsbn Plng Sr Engrs |
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| Various | GT&D GSO Gas Response Team | GT&D GSO Gas Response Team |
| Various | Account Services Gas Specialist | UO AS Lead Gas Specialists |

| WEB SITE POSTING & SHARED DIRECTORY | |
|---|---|
| Local Curtailment, EFO, OFO & Diversion Process Documents | http://uo/EO/GTD/GSO/GasControl/curtailments.htm |
| TSP Winter Plan website | http://wss/ge/sites/GasDesignPlanning/gtransplanning/ |
| Operating Guide | http://wss/ge/sites/GasDesignPlanning/gtransplanning/ |
| Area Winter Plan Meeting Presentations | http://wss/ge/sites/GasDesignPlanning/gtransplanning/ |
| Curtailment List [limited access] | \\fairfield07\tsp\Winter_Operating_Guide\Curtailment_List.xls |
| Winter Planning Models [limited access] | \\fairfield07\tsp\Winter_Operating_Guide_Models\ |

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# *1. CONTACT LISTS*

## ***Phone Lists***

# Transmission System Planning and Gas Planning Support Contact List (updated 11/16/09)

| Name | Function/Area | Lan ID | Phone | Cell/Pager | Home |
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| **Todd Hogensen** | **Gas Design & Planning, Director** | **(TRH4)** | **583-4144 (925) 974-4144** | **C: (925) 788-5296** | |
| Robynn Flores | Director's Assistant | | 583-4175 (925) 974-4175 | | |
| **Rick Brown** | **TSP & GPS, Manager** | **(RCB3)** | **583-4248 (925) 974-4248** | **C: (415) 264-2122** | **(925) 829-1292** |
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| Avella, Mike | **[ON ROTATION TO NORTH COAST DIV]** | (MJA3) | 323-7015 (707) 577-7015 | C: (707) 291-3543 P: (707) 288-7178 | (707) 537-7071 |
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| Gilmore, Nancy | Fresno | (NAH1) | 821-5159 (559) 263-5159 | C: (559) 246-0075 | (559) 298-7360 |
| Jones, Darin | Sacramento, Sierra, North Valley | (DRJ4) | 737-3299 (916) 408-3299 | C: (916) 580-9305 | (916) 624-5581 |
| Pace, Bob | Stockton, Yosemite | (RLP7) | 821-5053 (559) 263-5053 | C: (559) 246-5073 | (559) 322-9640 |
| Quaas, Thad | Diablo, East Bay, Mission, North Bay, North Coast | (TCQ2) | 737-3296 (916) 408-3296 | C: (916) 201-7056 | (530) 759-9972 |
| Reider, Jason | Central Coast, Kern San Francisco, De Anza, Peninsula, San Jose | (JTRc) | 821-5052 (559)263-5052 | C: (559) 246-5858 | (559) 299-6693 |
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| Aloiau, Mark | Gas Planning Support | (MKA4) | 223-8145 | P: (415) 253-2151 | (415) 922-3330 |
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| TSP & GPS, General Office | 77 Beale St, B16A, San Francisco, 94105 | (415) 973-6112 |
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| TSP & GPS, Fresno | 487 W. Shaw Ave., Fresno, 93704 | (559) 263-5426 |
| TSP & GPS, Rocklin | 3301 Industrial Avenue, Rocklin, 95765 | (916) 408-3263 |
| TSP & GPS, Santa Rosa | 111 Stony Circle, Santa Rosa, 95401 | (707) 577-7065 |

# Distribution Planning – Contacts
# (updated 12/12/2008)

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|---|---|---|---|---|---|
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| Diana Hayden | Secretary | (DLA5) | **721-5118 (916) 386-5118** | | |

| Area | Division | Name | Function | Phone | Lan ID | Fax | Address | Ext |
|---|---|---|---|---|---|---|---|---|
| 1 | Peninsula | Gail Siu | Sr Gas Engr | 626-7255 | GXS8 | 626-7297 | 275 Industrial Rd, San Carlos | (650)598- |
| | | Justin Neben | Gas Distr Engr | 626-7397 | JEN0 | | same as above | |
| | San Francisco | William Lam | Sr Gas Engr | 575-3228 | WQL1 | 575-3339 | 2180 Harrison, SF | (415)695- |
| | | Aiman Abusaif | Gas Distr Engr | 575-xxxx | AMA5 | | same as above | |
| | | Mike Fernandez | Gas Distr Engr | 575-3312 | MSFa | | same as above | |
| | | Wai Tang | Gas Distr Engr | 575-3297 | WXT9 | | same as above | |
| | | Mike Kerans | Gas Distr Engr | 575-3223 | MEKJ | | same as above | |
| 2 | Diablo | Frank Mahoney | Sr Gas Engr | 441-6329 | FAM4 | 441-6565 | 1030 Detroit Ave, Concord | (925)674- |
| | | Chris Wu | Gas Distr Engr | 441-6467 | CWW0 | | same as above | |
| | East Bay | Anthony Thompson | Sr Gas Engr | 443-2110 | AFT5 | 443-2144 | 4801 Oakport, Oakland | (510)437- |
| | | Nicole Lew | Gas Distr Engr | 443-2134 | NDL5 | | same as above | |
| | Mission | Jim Rechtin | Sr Gas Engr | 481-3376 | JGR8 | 481-3390 | 24300 Clawiter Rd, Hayward | (510)784- |
| | | Viktorija Samardzic | Gas Distr Engr | 481-2155 | VxSJ | | same as above | |
| 3 | Central Coast | Bill Terry | Sr Gas Engr | 642-3325 | WDT2 | 642-3634 | 401 Work St, Salinas | (831)784- |
| | | Al Garcia | Gas Distr Engr | 642-3421 | AOG2 | | same as above | |
| | San Jose | Gary Sorensen | Sr Gas Engr | 624-1108 | GES6 | 624-1089 | 308 Stockton Ave., SJ | (408)299- |
| | | Scott Fannin | Gas Distr Engr | 624-1711 | SRFa | | same as above | (408)494- |
| | De Anza | Rosa Barajas | Gas Distr Engr | 625-2143 | RMCv | 625-2252 | 10900 N. Blaney, Cupertino | (408)725- |
| 4 | Fresno | Bruce Wessels | Sr Gas Engr | 821-7335 | BWW1 | 821-5583 | 705 P St, Fresno | (559)263- |
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| | Kern | Joe Bernal | Gas Ops Engr | 874-5751 | JHB8 | | 4101 Wible Rd, Bakersfield | (661)398- |
| 5 | Yosemite | John Hunter | Sr Gas Engr | 847-6630 | JDHd | 847-6618 | 1524 North Carpenter, Modesto | (209)576- |
| | | Jeff Pace | Gas Distr Engr | 847-6530 | JJP7 | | same as above | |
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| 6 | North Valley | Heidi Lydon | Sr Gas Engr | 758-4701 | HLL2 | 758-4414 | 460 Rio Lindo, Chico | (530)894- |
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| | | Hall Hackney | Gas Distr Engr | 721-5271 | BHH2 | | same as above | |
| | | Wes Crail | Gas Distr Engr | 721-5119 | WGC7 | | same as above | |
| | Sierra | Ed Wong | Sr Gas Engr | 732-3254 | EKW4 | 732-3297 | 333 Sacramento, Auburn | (530)889- |
| | | Leo Stewart | Gas Distr Engr | 732-5077 | LRS3 | | same as above | |
| 7 | North Bay | Jason Tanihara | Sr Gas Engr | 326-3404 | JST5 | 326-3429 | 999 Third St, San Rafael | (415)257- |
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| | North Coast | Mike Avella | Sr Gas Engr | 321-6475 | MJA3 | | 3965 Occidental Rd, Santa Rosa | (707)579- |
| | | Keith Gockel | Gas Ops Engr | 321-6398 | KAG3 | 321-6110 | same as above | |
| | | Tanya Bowland | Gas Distr Engr | 321-6467 | TABb | | same as above | |

# *2. SYSTEM DESCRIPTIONS*

**This section of the guide includes a brief description of the local gas transmission systems, locations, MAOP's, and constraints on each system by area.**

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# System Descriptions
# Winter 2009 - 2010

## *NORTH COAST AND NORTH BAY*

***Serves: North Bay, North Coast, and Sacramento Division (Fairfield and Vacaville)***

**North Coast L177 Humboldt System:** Constrained under CWD, but not APD if noncore is off line. Depending on power plant use, is potentially constrained under warmer than CWD temperature conditions. At warmer than CWD conditions, system performance will be monitored to determine if and when power plant use should be reduced. The system has sufficient capacity for 1 power plant unit (670 MCFH) and CWD core & noncore use. At colder than CWD the power plant's 2nd unit will be curtailed.

**North Bay L210/21 System**: Fed by Creed Station from L400 into L210A & B at a maximum of 650#. L210 serves numerous DFMs and regulates to 450# at Napa Y Meter Station into L21 A & B. L210C branches off at Cordelia Reg Station to feed Vallejo, Benicia, and East Bay load across the Carquinez Bridge. L21A & B serve numerous DFMs, feeding south into Marin County and north to Willits. In North Coast Division, the transmission system is dependent upon both Santa Rosa compressor units running during stage 1 & 2 conditions. L21 is constrained under APD conditions at Monroe Reg Station in Santa Rosa.

**North Coast Sebastopol 275#/150# DFM: Fed from Madrone Avenue Reg Station at Stony Point Road and Madrone Avenue.** Is not constrained under CWD or APD.

**North Coast Cotati/Rohnert Park 150# DFM**: Fed from Cotati Reg Pit at West Cotati Avenue and Old Redwood Highway in Cotati and from US 101 & Old Redwood Highway Reg Station in Petaluma. The system is separated from the Santa Rosa 200# DFM by V-35.18 at Mountain View and Santa Rosa Avenues in Santa Rosa. Is not constrained under CWD or APD.

**North Coast Santa Rosa 200# DFM: Fed from Monroe Reg Station at Manhattan Way and West College Avenue in Santa Rosa and from 5th Street West & MacArthur Reg Station in Sonoma.** The system is separated from the Cotati/Rohnert Park 150# DFM by V-35.18 at Mountain View and Santa Rosa Avenues in Santa Rosa. Is not constrained under CWD or APD.

**North Coast Schellville 150# DFM**: Fed from the Schellville Reg Station in Schellville/Sonoma. Is not constrained under CWD or APD.

**North Coast Fulton/Healdsburg 150# DFM**: Fed from Hart Lane & Fulton Road Reg Station and Grant School Road Reg Station in Healdsburg. Is not constrained under CWD or APD.

**North Bay Pine Street 150# DFM**: Fed from Pine Street Reg Station in Napa and is separated from the Trancas 250# DFM by V-4.35 in the Coffield Avenue Reg Station. Is not constrained under CWD or APD.

**North Bay Trancas 250# DFM**: Fed from Coffield Avenue Reg Station in Napa. The system is separated from the Pine St, 150# DFM by V-4.35 in the station and is separated

from the Napa 150# DFM by V-5.01 at the Lincoln and Solano Avenue valve cluster in Napa. Is not constrained under CWD or APD.

**North Bay Napa 150# DFM**: Fed from Solano Avenue Reg Station at Redwood Road and Solano Avenue in Napa and is separated from the Trancas 250# DFM by V-5.01 at the Lincoln and Solano Avenue valve cluster in Napa. Is not constrained under CWD or APD.

**North Bay Napa Y 150# DFM**: Fed from Napa Y Meter Station. Is constrained under APD conditions.

**North Bay Calistoga/Angwin 250/150# DFM: Fed from Zinfandel Road Reg Station at Zinfandel Lane and Highway 29. Fed from Zinfandel Road Reg Station at 250# and regulated at York Creek Reg Station in St. Helena to 150#.** Is not constrained under CWD or APD.

**North Bay Hiddenbrooke 150# DFM**: Fed from the Sky Valley Reg Station on L210C. Is not constrained under CWD or APD.

**North Bay Benicia Industrial Park 175# DFM**: Fed from the East 2nd Street & Reservoir Road Reg Station in Benicia. Is not constrained under CWD or APD.

**North Bay Benicia 150# DFM**: Fed from the Glen Cove and Benicia Road Reg Station in Benicia and from Vallejo Station at Maple and Reis Avenue in Vallejo. Is not constrained under CWD or APD.

**North Bay Mare Island 100# DFM**: Fed from the Pine & Woodrow Avenue reg Station in Vallejo. Is not constrained under CWD or APD.

**North Bay Vallejo 250# L21H**: Fed from Herrmann Station in Vallejo and from Napa Y Meter Station. Is not constrained under CWD or APD

**North Bay Novato Blvd. 150# DFM**: Fed from Novato Blvd. & Diablo Avenue Reg Station in Novato. Is not constrained under CWD or APD

**North Bay Lincoln/Fairhills 175# DFM**: Fed from the San Rafael Meter and Reg Station. Is not constrained under CWD or APD

**Sacramento Travis/Vacaville 400# DFM**: Fed by L210A & B at the Vacaville Reg Station. Is not constrained under CWD or APD

**Sacramento Fairfield/Tabor 230# DFM**: Fed from the Suisun-Fairfield Reg Station at Ohio Street and Union Avenue in Fairfield. Is not constrained under CWD or APD

**Sacramento Rancho Solano 250# DFM**: Fed from L210A & B regulation at Cordelia and Chadbourne Roads. Is not constrained under CWD or APD

**Sacramento Vacaville North 400# DFM**: Fed from the Vaca Dixon Primary Reg Station in north Vacaville. Is not constrained under CWD or APD.

**Sacramento Vacaville South 400# DFM**: Fed from the Hawkins and Lewis Primary Reg Station in Elmira/Vacaville. Is constrained APD conditions.

# System Descriptions
# Winter 2009 - 2010

## *SACRAMENTO VALLEY LOCAL TRANSMISSION SYSTEM*

***Serves: Sacramento, Sierra, and North Valley Division***

**I. Line 402** supplies Cottonwood, Anderson, Redding, Enterprise, Shasta and Project City along with the City of Redding Power Plant and Lehigh Cement (formerly Calaveras Cement.) The line is not projected to be constrained under CWD conditions, but may become constrained at temperatures below CWD if the City of Redding Power Plant and Lehigh Cement are operating at full-load. The constrained locations are:

1. Calaveras Cement Meter and Regulator Station
2. Enterprise DFM, Distribution Regulator Station R-42

Therefore, curtailments may be necessary to serve core and partial noncore loads at temperatures below CWD (Stage1 and Stage 2). However, curtailments are not likely since Redding Electric Utility intends to only operate its new CT unit as base load (571 Mcf/hour) during the winter season and is not likely to operate its older, less efficient, power plant (1292 Mcf/hour) during the winter season. Should the larger power plant come on-line during peak winter load conditions, the smaller CT unit will trip at 400 psig and the larger unit will trip at 250 psig – both of which will occur before they have an adverse impact on service to the balance of the customers served by Line 402. For added protection, Line 402 has a back-pressure regulator in operation at the Redding Electric Utility meterset, which will close when the pressure in Line 402 drops to 300 psig.

**II. The Sacramento Valley Local Transmission System (SVLTS)** The Sacramento Valley Local Transmission System (SVLTS) consists of three interconnected segments – the North Valley Division segment, the Sacramento "Loop" segment which supplies Sierra and Sacramento Divisions and the Stockton Division segment which also supplies south Sacramento Division. The Sacramento "Loop" is supplied mainly from Line 400 at Buckeye PLS plus additional supplies from local gas producers and Line 400 at Creed Station and delivers gas to Yuba City, Grass Valley, Lincoln, Roseville, Rocklin, Auburn, Folsom, Sacramento, Elk Grove and Davis, among other locations. The Stockton Division segment is supplied from Line 400 at Creed Station plus additional supplies from local gas producers in the Rio Vista area and delivers gas to Lodi, Galt and Elk Grove / Laguna.

The Wild Goose Storage Field is connected to Line 167 adjacent to the Wild Goose Mixer Station northwest of Yuba City and Line 400 at Delvan Compressor Station via a 20 mile pipeline and exchanges gas with PG&E throughout the year (both injection and withdrawal) on an "as-available" basis after all other PG&E operating requirements are met. Injection to Wild Goose Storage is provided primarily through the interconnection to Line 400 and withdrawal volumes are scheduled for receipt into Line 167 as a first priority to L400.

The flow of gas into the northern leg of the Sacramento "Loop" Segment out of Hershey Junction is separated from the flow of gas into the southern leg out of Hershey Junction at Closed Line 123 Baseline Road Main Line Valve 3.42. Valve 3.42 remains closed

throughout the year to maintain the necessary therm billing area separation required between H01 and H07 supplied out of Yuba City Holder Station and P16, P06, P05, P01 and P19 supplied out of Swingle Junction Station.

The Stockton Division Segment has a normal winter and a normal summer season operating mode. During the winter season, the flow of gas into the Stockton Division segment out of Creed Station is separated from the adjacent Modesto LT System to the south at Closed Line 108 MLV 36.10 at 8-mile Road and from the Sacramento "Loop" to the north at Closed Line 108 MLV 66.14 north of Elk Grove / Laguna. Both valves remain closed throughout the winter season (~Nov 20 – March 20 per Transmission System Planning's recommendation) to maintain the necessary therm billing area separation required between the Stockton Segment and the adjacent systems supplied out of Hershey Junction to the north and Vernalis Station to the south. During the summer season (~March 20 – Nov 20 per Transmission System Planning's recommendation), the flow of gas into the Stockton Segment out of Creed Station is separated from the Modesto LT System to the south at Closed Line 108 MLV 22.31 at French Camp Rd (MLV 36.10 is Open during the summer season) to provide adequate mixing of L400 gas with local production gas and maintain the BTU value of gas delivered into Las Vinas Station within the acceptable range for the Lodi area (990 -1080).

The Stockton Division Segment also has a High local BTU emergency operating mode which requires shifting the supply into the Elk Grove/Laguna area from Las Vinas Station to the south over to the Sacramento Gas Load Center to the north should the BTU value of the gas into Las Vinas exceed 1050. This involves opening Line 108 MLV 66.14 north of Elk Grove and closing L108 MLV 50.69 at Thornton Station west of Galt.

Under other emergency conditions, SP4Y that normally operates at 30 psig can be operated near the MOP of 685 psig to back feed gas from Line 401 at Tap 295.10 into the Stockton Division Segment at Brannon Island, east of Rio Vista.

The SVLTS is projected to have sufficient capacity down to Stage 1 load conditions, and constrained between Stage 1 and Stage 2 load conditions at the following locations:

1. Line 173, Auburn Distribution Regulator Station
2. Barton Road DFM, Granite Bay Distribution Regulator Station R-411
3. Folsom DFM, El Dorado Hills Regulator Station
4. Turner Road DFM, LOHP 24 Regulator Station

Curtailments will be necessary to serve core loads at temperatures below Stage 1.

The following are notable large customer elevated delivery service pressure accounts, which are maintained in accordance with Gas Rule 2:

1. UCD Med Center Cogen, Sacramento (9845491333) – 375 psig
2. SMUD McClellan Park Cogen, North Highlands (7501753999) – 200 psig
3. NCPA-Roseville Peaker Power Plant (7668411268) – 225 psig
4. Calpine CPN Pipeline, Sutter County (1376777337) – 550 psig

5. Calpine Greenleaf 1 Power Plant (3710117822) – 650 psig
6. Calpine Greenleaf 2 Power Plant (2126784590) – 650 psig
7. Calpine Yuba City Energy Center (4001788642) – 250 psig
8. Calpine Feather River Energy Center (9862656461) – 300 psig
9. Roseville Energy Center Power Plant, Roseville (6339329484) – 100 psig
10. NCPA2 – Thornton Rd, Lodi Power Plant (2168412663) – 200 psig
11. NCPA3- Turner Rd, Lodi Power Plant (1376746047) – 200 psig
12. General Mills, Lodi (3710105306) – 240 psig

# *STOCKTON LOCAL TRANSMISSION SYSTEM*

***Serves: Stockton Division***

Stockton Division has a normal winter and a normal summer season operating mode. During the winter season, the flow of gas into Stockton Division out of Creed Station is separated from the adjacent Modesto LT System to the south at closed Line 108 MLV 36.10 at 8-mile Road and from the Sacramento "Loop" to the north at Closed Line 108 MLV 66.14 north of Elk Grove / Laguna. Both valves remain closed throughout the winter season (~Nov 20 – March 20 per Transmission System Planning's recommendation) to maintain the necessary therm billing area separation required between the Stockton Segment and the adjacent systems supplied out of Hershey Junction to the north and Vernalis Station to the south. During the summer season (~March 20 – Nov 20 per Transmission System Planning's recommendation), the flow of gas into Stockton Division out of Creed Station is separated from the Modesto LT System to the south at closed Line 108 MLV 22.31 at French Camp Rd (MLV 36.10 is Open during the summer season) to provide adequate mixing of L400 gas with local production gas and maintain the BTU value of gas delivered into Las Vinas Station within the acceptable range for the Lodi area (990 -1080).

Rio Vista, Galt, Lodi, Lockeford, Ione, Valley Springs, and San Andreas will continue to be served from Las Vinas, which is fed from Line 400/401 at Creed. For further details, see the section for System Descriptions for the Sacramento Valley Local Transmission System.

During the winter months, Vernalis Tap supplies customers served from L-108 between French Camp and Eight Mile Road, including the City of Stockton.. The MOP of between Vernalis Tap and Ripon-Modesto Meter Station is 720 psig. Between Ripon-Modesto Meter Station and Eight Mile Road the MAOP is 408 psig.

The transmission system between French Camp and Eight Mile Road is not constrained and curtailments are not anticipated for Stage 1 or 2 conditions.

# System Descriptions
# Winter 2009 - 2010

## *EAST BAY LOCAL TRANSMISSION SYSTEM*

***Serves: Diablo, East Bay and Mission Division***

The East Bay gas transmission system serves Diablo, East Bay and Mission Division and is divided in to four curtailment zones. Below is a brief description of the five curtailment zones.

1) **EASTBAY**: The East Bay Local Transmission System (LTS) includes SP3/5, L-191, L-105, & L-153. This system stretches from Antioch to San Pablo, and then south to Irvington Station.

2) **TRIVLYDFMS**: The Tri-Valley DFM System includes the Dublin, Pleasanton and San Ramon DFM's served from L131.

3) **BAYLOOP**: The Bay Area Loop is part of the backbone transmission system that passes through Diablo Division and Mission Division including L-303, L-131, L114, and L-107.

4) **MORAGA DFM:** A potentially constrained DFM within the larger EASTBAY Zone. This system extends from L-191S into the city of Moraga. Currently, distribution loading is shifted to the parallel Gloreitta DFM. St. Mary's College is the sole Non-Core customer in this Zone

**East Bay Local Transmission System**

The East Bay LTS contains 3 primary systems fed by 3 sources and 1 underground storage facility. Under normal operations, these three systems operate independently of each other, but crossties can be used between each of them.

**South System - L153 & L105 from Irvington Sta to S/S San Pablo Station**
L153 between Irvington Sta and Marina Sta
System pressures: MAOP=420 PSIG, NOP=400-405 PSIG
Source Gas: Irvington Sta, M-2
Major issues: None.
Opns concerns: Section of line used primarily to bring high-pressure source gas deep into the high load areas in Hayward and Oakland areas. Currenlty requires a 325 Minimum inlet pressure at Irvington for APD flows.

L153 Between Marina Sta and Oakland Gas Load Center (GLC)
System pressures: MAOP=246 PSIG, NOP=240-245 PSIG
Source Gas: L153, Marina Sta.
Major issues None.

L105 between Irvington Sta and San Lorenzo Sta
System pressures: MAOP=250 PSIG, NOP=245-250 PSIG
Source Gas: Irvington Sta, M-1

Major issues: None
Opns concerns: Section of line used primarily to bring high-pressure source gas deep into the high load areas in Oakland and Berkeley areas. The EBGLC spikes flows into L105A under normal opns.

L105 between San Lorenzo Sta and Carlson & Adams BTU Valve (V-44.54)
System pressures: MAOP=150 PSIG, NOP=145 PSIG
Source Gas: 1) L153, Fairway X-Over, 2) L153, East Bay GLC, 3) L105, San Lorenzo Sta
Major issues: None.
Opns concerns: Section of line feeds major end-use customer load in Oakland & Berkeley areas. Can be backfed via San Pablo Station if necessary.

**North System - L105B & L105A from Herrmann Sta to N/S Carlson & Adams BTU Valve**
L21/L105B between Herrmann Sta and San Pablo Station
System pressures: MAOP=400 PSIG, NOP=400 PSIG
Source Gas: L21, Herrmann Sta
Major issues: There are currently substantial issues surrounding Chevron, which is served from San Pablo Sta and Crockett Cogen. Current minimum of 387 PSIG guaranteed to Crockett Cogen through 2011 will limit operational flexibility of this line. Any work which will impact flows and/or pressures at San Pablo should be highlighted to Chevron.
Opns concerns: Line can be used to backfeed SP-3 system.

L105A between San Pablo Sta and Carlson & Adams BTU Valve (V-44.54)
System pressures: MAOP=150 PSIG, NOP=140 PSIG
Source Gas: L105B, San Pablo Sta Sta

Major issues: None.
Opns concerns: None.

**North System - SP-3 & L191 from Antioch Terminal to San Pablo Sta**
L191/SP-5/SP-3 between Antioch Terminal and Los Medanos
*Refer to this system as the 600 PSIG system to avoid confusion.*
The naming of these systems can be confusing. 600 PSIG gas leaves Antioch through L191, then becomes SP-5 at Antioch Town Mtr Sta, then becomes SP-3 at Delta Fair Junction.
System pressures: MAOP=600 PSIG*, NOP=500-600 PSIG
Source Gas: 1) Antioch Terminal, Tubes 12&13A and/or 14&15A, 2) Los Medanos Storage Facility
Major issues: Mostly operational issues.
Opns concerns: Current limitation of MAOP to 497 PSIG when tied to L114 at Antioch. Setpoint at SP3/L191 Crosstie and demand of Pittsburg PP can limit the system capacity. Withdrawal/injection at Los Medanos critical to accurate modeling of system.

SP-5/L191 between Antioch Terminal and SP-3/L191 Crosstie
*Refer to this system as the 338 PSIG system to avoid confusion.*
System pressures: MAOP=338 PSIG, NOP=240-335 PSIG
Source Gas: 1) Antioch Terminal, Tube 7, 2) SP-3 via SP-3/L191 Crosstie

Major issues: Mostly operational issues.
Opns concerns: System designed primarily to feed Pittsburg Power Plant. Primary feed from Antioch up to approx. 8 MMcfh, balance of PPP load comes from Crosstie at a setpoint of 240 PSIG. When PPP is not up and running, placement of production out of Antioch becomes limited and gas spills from L191N to L191S via a check valve at the Crosstie. Gas Control likes to keep the setpoint of L191S as low as possible to enhance this placement of production.

L191S between SP-3/L191 Crosstie and Plaza Reg Sta BTU Valve
System pressures: MAOP=338 PSIG, NOP=290-338 PSIG
Source Gas: SP-3 via SP-3/L191 Crosstie
Major issues: None
Opns concerns: Gas Control likes to keep the setpoint of L191S as low as possible to enhance the placement of production when PPP is not taking high volumes.

191S between Martinez Mtr Sta and Plaza Reg Sta BTU Valve
System pressures: MAOP=268 PSIG, NOP=268 PSIG
Source Gas: SP-3, Martinez Mtr & Reg Sta
Major issues: None.
Opns concerns: None.

SP-3 between Los Medanos and Franklin Canyon
System pressures: MAOP=467 PSIG, NOP=390-400 PSIG*,
Source Gas: SP-3, Los Medanos Reg Sta
Major issues: None.
Opns concerns: Can be backfed from Franklin Canyon. See …\SP5DIG for details.
* Due to automated valve at Franklin Canyon

SP-3 between Franklin Canyon and San Pablo Sta
System pressures: MAOP=249 PSIG, NOP=245 PSIG
Source Gas: SP-3, Franklin Canyon Reg Sta
Major issues: None.
Opns concerns: Can be backfed at San Pablo Sta.

**Tri-Valley DFM System**

The Tri-Valley DFM system is fed from the Backbone Transmission Line-131 at two locations. The majority of this flow is tapped near valve location 32.38 and feeds the Dublin Feeder. The balance of the systems needs are served from a tap at the Isabel Reg Station (V-34.04). Four interdependent Distribution Feeder Mains serve the Tri-Valley area

***DUBLIN FEEDER (DFM)***
***System pressures: MAOP = 500 psig***
***Model nodes: L-131 – DUBRL30***
***Major issues: None.***
***Opns. Concerns: None.***

***STANLEY DFM***
***System pressures: MAOP = 220 psig***
***Model nodes: ISABEL – PLSRL27***
***Major issues: None.***
***Opns. Concerns: None.***

**BLACKHAWK DFM**

System pressures: MAOP= 500 psig
Model nodes: DUBLIN45 – BLKRL38
Major issues: Additional Winter load picked up during winter season.
Operational Concerns: Monitor BLKRL38 during peak flow periods. Blackhawk DFM sets minimum required inlet pressure from L-131

**SAN RAMON/FOOTHILL DFM**

System pressures: MAOP= 160 psig
Model nodes: DUBLIN RL30 – FTHRL16/SNRRL26
Major issues: Sensitive to high flows. Mission Division Gas T&R typically mans stations beyond Cold Winter Day temperatures.
Opns. Concerns: None

# System Descriptions
# Winter 2009 - 2010

## *PENINSULA LOCAL TRANSMISSION SYSTEM*

***Serves: San Francisco, Peninsula, De Anza Division, and north San Jose Division***

The Peninsula LTS is fed by Milpitas Terminal through Lines 101, 109, and 132 and includes two open cross ties through L132A and L147 and one normally closed cross tie through L132B. There are three additional cross-ties that are normally closed that can be opened to provide additional capacity if necessary. These lines serve numerous DFMs and regulate to a lower pressure at three San Francisco border stations, before terminating at the San Francisco GLC.

**SF Peninsula L101/109/132 System #1: MAOP 375 psig, NOP 250 – 375 psig**
Supplied from Milpitas Terminal and feeds 16 DFMs and three SF border stations. Line 132A ties L101 with L109/132 between Rengstorff Avenue Station and Sierra Vista Avenue Crossover. Line 147 ties L101 with L109/132 between Commercial and Old County Road (San Carlos) and Edgewood Road Crossover. Four Peninsula major station crossties located at Martin Station, Healy Station, Crystal Springs and Ralston Avenue Crossovers, which are normally closed, could be opened to improve capacity. Is constrained .

**SF Peninsula L101/109/132 System #2: MAOP 145 psig, NOP 134 – 140 psig**
Regulated from 375 psig MAOP to 145 psig MAOP at Sullivan Avenue Regulator Station (L109), Martin Station Regulation Station (L132), and Lomita Park Meter Station (L101). Includes a normally closed crosstie through L132B between Martin Station and L101. Feeds one major SF power plant (Potrero as Hunters Point is no longer operational). Is constrained .

**N. 1st DFM (San Jose Division): MAOP 200 psig, NOP 190 psig**
Fed from L132 at N. 1st and Tasman in San Jose. Is not constrained under CWD or APD.

**Lafayette DFM (San Jose Division): MAOP 180 psig, NOP 175 psig**
Fed from L132 at Lafayette St. n/o Hogan Dr. in Santa Clara. Also has a 6,000’ tie of 6” main to L109 at Lafayette St. s/o Highway 237 in Santa Clara, which is normally closed at L109. Is constrained .

**Zanker DFM (San Jose Division): MAOP 175 psig, NOP 170 psig**
Fed from L101 w/o Zanker Rd. and n/o Highway 237 in San Jose. Bridled to L101 but normally closed. Is not constrained under CWD or APD.

**Grant-Stevens Creek-Lawrence DFM (De Anza): MAOP 180 psig, NOP 170-177 psig**
Fed from L132 at Lawrence Expressway and Lakehaven Dr. in Sunnyvale and from L132 at Whisman Rd. n/o Central Expressway in Mountain View. Is constrained .

**Britton DFM (De Anza Division): MAOP 240 psig, NOP 225 psig**
Fed from L132 at Ahwanee and Lakehaven Dr. in Sunnyvale. Serves two noncore (both Northrup Grumman) and one core customer. Is not constrained under CWD or APD.

**El Monte DFM (De Anza Division): MAOP 242 psig, NOP 193 psig**
Fed from L109 and L132 at Sierra Vista Ave. Crossover in Mountain View. Is constrained .

**Moffett Field / NASA DFM (De Anza Division): MAOP 400 psig, NOP 150 psig**
Fed from L101 at Moffett Blvd. in Sunnyvale. Serves one noncore customer (NASA – Ames Research) and is not constrained under CWD or APD.

**SRI / Raychem DFM (Peninsula Division): MAOP 180 psig, NOP 170 psig**
Fed from L101 at Ringwood and Van Buren Rd. in Menlo Park. Serves two noncore customers (SRI and Raychem) and is not constrained under CWD or APD.

**Foster City DFM (Peninsula Division): MAOP 180 psig, NOP 170 psig**
Fed from L101 at Pacific Blvd. and Poinsettia Ave. in San Mateo. Is not constrained under CWD or APD.

**Middlefield DFM (Peninsula Division): MAOP 124 psig, NOP 120 psig**
Fed from the Ringwood DFM at the SRI property. Is not constrained under CWD or APD.

**Portola Valley DFM (Peninsula Division): MAOP 175 psig, NOP 170 psig**
Fed from L132 at Alpine Rd. and Piers Ln. in Menlo Park. Bridled to L109 but normally closed. Is not constrained under CWD or APD.

**Walsh DFM (Peninsula Division): MAOP 230 psig, NOP 225 psig**
Fed from L109 at Walsh and Valley Rd. in Atherton. Bridled to L132 but normally closed. Is not constrained under CWD or APD.

**Todo El Mundo DFM (Peninsula Division): MAOP 140 psig, NOP 120 psig**
Fed from L109 at Woodside Rd. and Highway 280 in Woodside. Bridled to L132 but normally closed. Is not constrained under CWD or APD.

**Haciendas DFM (Peninsula Division): MAOP 110 psig, NOP 110 psig**
Fed from L132 at Woodside Rd. and Highway 280 in Woodside. Bridled to L109 but normally closed. Is not constrained under CWD or APD.

**Ralston DFM (Peninsula Division): MAOP 150 psig, NOP 132 psig**
Fed from L109 at Highway 92 and Highway 280 in Belmont. Bridled to L132 but normally closed. Is constrained.

**Pacifica DFM (Peninsula Division): MAOP 90 psig, NOP 86 psig**
Fed from L109 at San Pedro Valley Primary Regulator Station (e/o Monterey Dr. and w/o Skyline Blvd.) in San Bruno. Is not constrained for Stage 2.

**Half Moon Bay DFM (Peninsula Division): MAOP 400 psig, NOP 375 psig**
Fed from L109 at tap 28.55 and bridled to L132 at tap 29.68 which is normally closed (e/o Lexington Ave. and White Plains Ct.) in San Mateo. Is not constrained under CWD or APD.

## *SOUTH SAN JOSE LOCAL TRANSMISSION SYSTEM*

### South San Jose: (Note – all DFMs are radial feed systems)

**L-100 (San Jose Division): MAOP 400 psig, NOP 350 psig**

Fed from Milpitas Station, L-100 parallels Lines 300 A & B to its terminus at the old Silver Creek Pressure Limiting Station (Silver Creek and Greenyard). L-100 consists mainly of 16- and 12-inch pipe. L-100 supplies the Mabury Rd. and Tully Rd. DFMs as well as distribution regulators feeding the Milpitas and East San Jose Areas. Is not constrained during CWD or APD.

**Barber DFM (Old King Rd. DFM), San Jose Division): MAOP 200 psig, NOP 190 psig**

Fed from Milpitas Station, the Barber DFM supplies a few distribution regulators off of Barber Ln. and King Road terminating at the distribution regulator at Murphy and Lundy Roads. Parts of the King Rd. DFM were removed and some sections are included in the Mabury Rd. and Tully Rd. DFMs. Is not constrained for CWD or APD.

**Mabury Rd. DFM (San Jose Division): MAOP 558 psig, NOP 350 psig**

Mainly supplied from L-100 but connected by valves to both L-300A and L-300B. The Mabury Rd. DFM floats off of L-100 pressure until regulated to 200 psig at Mabury Rd. near Pine Hollow. The Mabury Rd. DFM feeds the distribution systems in North Central San Jose terminating at the distribution regulator station at Autumn and Julian. Is not constrained for CWD or APD.

**Tully Rd. DFM (San Jose Division): MAOP 200 psig, NOP 197 psig**

The Tully Rd. DFM is supplied by L-100 and serves the South Central San Jose area, including the downtown as well as customers in the Eastern Los Gatos area. The Tully Rd. DFM is separated from the Fontanoso Rd. DFM by a closed valve at Almaden Blvd. and Blossom Hill Rd. in South San Jose. This valve can be opened for short periods of times when needed for shutdowns or emergency conditions. The Tully Rd. DFM is also connected to L-300A&B. This system is constrained for Stage 2.

**Fontanoso Rd. DFM (San Jose Division): MAOP 375 psig, NOP 350 psig**

The Fontanoso Rd. DFM is the only DFM in the South San Jose area solely supplied by L-300A. It serves the Southern part of San Jose including the IBM and high tech industrial section off Monterey Highway. The Fontanoso Rd. DFM operates at 365 psig at the L-300A tap and is regulated further at Poughkeepsie and Cottle Rd. to 240 psig and at Monterey Highway near IBM to 100 psig. As noted above, the Btu separation valve at Almaden Blvd. and Blossom Hill Rd. can be opened for emergencies and short duration operating procedures but cannot sustain a loss of L-300A supplies during cold weather. Most of the recent residential growth in the San Jose area has occurred in the Almaden Valley, which is solely supplied by the Fontanoso Rd. DFM. This system is not constrained for CWD or APD.

**Abbott Ave. DFM (San Jose Division): MAOP 375 psig, NOP 190 psig**
The Abbott Ave. DFM is a short piece of 6-inch pipe that supplies the distribution regulator station at Abbott Ave. and Sierra Way and serves customers in Milpitas. The Abbott Ave. DFM is supplied from Milpitas Station and is connected to L-100 as well. Is not constrained for CWD or APD.

**Dixon Landing DFM (San Jose Division): MAOP 175 psig, NOP 170 psig**
The Dixon Landing DFM is supplied by L-131 and feeds three distribution regulators in Milpitas. It is also tied to L-107 in case of a loss of supply to L-131. Is not constrained for CWD or APD.

**Gilroy/Morgan Hill: (Note – all DFMs are radial feed systems)**
**Bloomfield DFM (San Jose Division): MAOP 400 psig, NOP 395 psig**
Fed from L-300A, the Bloomfield Rd. DFM consists of mostly 16-inch pipe supplying the Southern Gilroy area. Calpine's Gilroy Cogen plant is supplied by the Bloomfield Rd. DFM as well as several other large, noncore customers. The Bloomfield Rd. DFM supplies the majority of the Gilroy integrated distribution system, which includes the Bonafante Gardens and the Eagle Ridge residential development. Is not constrained for CWD or APD.

**Roop DFM (San Jose Division): MAOP 120 psig, NOP 115 psig**
Roop Rd. DFM is also supplied from L-300A and delivers gas to the integrated Gilroy 55 psig distribution system. The Roop Rd. DFM consists of mostly 2-inch pipe and is very sensitive to any increase in demand. There are no large customers or residential growth forecasted in the area supplied by Roop Rd. Is not constrained for CWD or APD.

**Church DFM (San Jose Division): MAOP 335 psig, NOP 330 psig**
Fed from L-300A, Church Ave. DFM supplies mostly residential and small commercial customers along Church Ave. to Monterey Highway. Consisting of 4- and 6-inch pipe, Church Ave. DFM is an important supply to the integrated 55 psig distribution system providing security for customers in the northern Gilroy area. Is not constrained for CWD or APD.

**Diana DFM (San Jose Division): MAOP 250 psig, NOP 240 psig**
Diana Ave. DFM is supplied by L-300A but also tied to L-300B through a bridle valve. The Diana Rd. DFM is the main gas source to Morgan Hill and consists of mostly 4-inch pipe. Is constrained for Stage 2.

**Cochrane DFM (San Jose Division): MAOP 320 psig, NOP 308 psig**
Fed from L-300A at Cochran Rd. and Peet, the Cochran Rd. DFM consists of 2-, 4- and 6-inch pipe and supplies the integrated Morgan Hill distribution system just South and East of Highway 101 at Cochran Rd. Is not constrained for CWD or APD.

## *CENTRAL COAST LOCAL TRANSMISSION SYSTEM*

***Serves: Central Coast Division, including Moss Landing Power plant, Salinas, Monterey, Castroville, Carmel, Soledad, Greenville, Kings City, San Ardo, Gonzales, Watsonville, Santa Cruz, Davenport, and Felton.***

The Central Coast LTS is fed mainly from L-300A&B at Hollister Meter Station through L-301A (396 psig) and L-301G (500 psig). Under normal operations, L-181A&B taps L-301G to serve the Watsonville and Santa Cruz areas. L-103 (350 psig) and L-301B (408 psig) taps L-301G at Bolsa Meter Station and Dolan Road Meter Station, respectively, to feed south towards Monterey and Salinas areas. L-187 (313 psig) feeds from Salinas to San Ardo. L-310 is fed from L-300 at Tres Pinos station and mainly feeds Calpine's power plant in King City. A 130 psig DFM cross-tie exists between L-310 and L-187 at Kings City.

The Central Coast LTS is not projected to be constrained under CWD conditions, but may become constrained at temperatures below CWD if all noncore customers are operating at full load. Therefore, curtailments may be required to serve core and partial noncore loads at temperatures below CWD (Stage 1 and Stage 2).

## *Yosemite Local Transmission System*

***Serves: Serves portions of Yosemite and Stockton Divisions, including the cities of Modesto, Oakdale, Escalon, Hughson, Livingston, Ceres, northern Merced, Turlock, Atwater, Winton, Ripon, Stockton, Manteca, and Lathrop.***

The Yosemite LTS and Stockton areas are fed from Line 2 through L-108 at Vernalis Tap, and from L-401 through L-215 at Oak Flat Tap. L-108 and L-215 are further cut to intermediate DFM pressure levels throughout the Yosemite LTS. These include the Ripon/Modesto 408 psig DFM, the Modesto 260 psig DFM, the Ceres/Turlock 260 psig DFM, and the Oakdale/Escalon 180 psig DFM.

Beginning with the winter of 2008-09, the BTU separation moved from French Camp (V-22.31) to Eight Mile Road (V-36.10). V-22.31 is to be opened and V-36.10 is to be normally closed, resulting in the city of Stockton being served from Vernalis Tap. Areas north of V-36.10 are fed from Creed via L-196.

V-60.45 at Merced is opened during CWD and colder conditions to support Fresno LTS.

The Yosemite LTS is not projected to be constrained under CWD conditions, but may become constrained at temperatures below CWD if all noncore customers are operating at full load. Therefore, curtailments may be required to serve core and partial noncore loads at temperatures below CWD (Stage 1 and Stage 2).

## *Fresno Local Transmission System*

***Serves: Serves portions of Fresno and Yosemite Divisions, including the cities of Fresno, Clovis, Selma, Sanger, Kerman, Biola, Fowler, San Joaquin, Tranquility, Chowchilla, Madera, and southern Merced.***

The Fresno LTS is supplied under normal operating conditions from one source at Helm Tap off L-300. L-111, L-138 and L-351 feed into the Fresno LTS. L-351, via L-111, is the major feed to the Fresno vicinity with L-138 continuing to provide support. L-111 is the primary feed to the Madera/Merced area. A back feed via V-60.45 in Merced is intended for use under extreme weather or emergency conditions and will support the northern Fresno LTS via the southern Yosemite LTS. This valve is remotely operated by the Gas Control Center to support the Fresno LTS under design day conditions or when pressures fall to 120 psig on the south side of V-60.45. L-134 also serves as a supplemental feed into the L-118 system. This feed operates when the pressure reaches 365 psig in L-118 at Herndon Jct., typically under cold weather conditions. L-111 and L-138 are reduced in pressure at several locations to intermediate DFM pressure levels. A major DFM, called the Fresno Belt Main is a looped 204 psig MAOP DFM, which serves the greater Fresno/Clovis metropolitan area.

The L-111 system is projected to be constrained at temperatures below CWD. Therefore, curtailments will be required to serve core and partial noncore loads at temperatures below CWD (Stage 1 and Stage 2) in this zone.

## *Bakersfield Local Transmission System*

***Serves: Serves portions of Kern Division, including the city of Bakersfield.***

The Bakersfield LTS is a looped system consisting of L-142N, L-142S, and L-375. This system is supplied under normal operating conditions from two sources off L-300. L-142N is supplied at Bakersfield Tap and L-142S is supplied at Gosford Tap. L-142S is cut to an intermediate pressure at Brundage/V Regulator Station due to MAOP limitations. Brundage/V and L-142N, from Bakersfield Tap, feed into Bakersfield Reg Station. Bakersfield Reg Station feeds into the East Bakersfield DFM and the Bakersfield Distribution System. L-375 is an extension off L-142N operating at the same pressure level and extends several miles and dead ends.

# *3. DESIGN CRITERIA SCADA ALARMS AND DESIGN TEMPERATURES*

GSO's SCADA alarm policy state that all SCADA alarms will remain at "Normal" settings until Design Criteria temperatures and/or flow rates are reached for a given local area. When Design Criteria conditions are projected to occur in a local area, Design Criteria Lo and LoLo alarms will replace the "Normal" alarms for a small set of key SCADA locations for that local transmission system.

To avoid confusion with current SCADA alarm settings, the Design Criteria Alarm settings have been removed from the Local Transmission Operating Guide and are now solely maintained by GSO. A copy of the alarm database can be obtained by contacting Alfred Musgrove at 223-3216 (Sr. TC Desk).

# APD and CWD Mean Daily Temperatures [1]

| Office Code | Billing Office | Weather Station | APD Temperature [2] (deg F) | CWD Temperature [3] (deg F) |
|---|---|---|---|---|
| XB | Angels Camp | Angels Camp | 26.3 | 37.0 |
| JC | Antioch | Concord | 28.5 | 38.1 |
| HB | Auburn | Auburn | 24.5 | 34.7 |
| TC | Bakersfield | Bakersfield | 25.1 | 36.5 |
| RB | Bayhill | Colma | 31.5 | 40.3 |
| RN | Belmont | Belmont | 29.8 | 39.4 |
| JR | Berkeley | Oakland | 29.5 | 39.8 |
| FF | Burney | Red Bluff | 25.4 | 36.4 |
| FB | Chico | Chico | 28.1 | 39.2 |
| TF | Coalinga | Fresno | 25.7 | 39.8 |
| PX | Colusa | Marysville | 26.8 | 38.0 |
| JG | Concord | Concord | 28.5 | 38.4 |
| VV | Cupertino | Cupertino | 31.6 | 41.0 |
| PY | Davis | Sacramento | 27.0 | 37.8 |
| JL | East Oakland | Oakland | 29.5 | 39.5 |
| LF | Eureka | Eureka | 26.3 | 36.7 |
| LJ | Fortuna | Eureka | 26.3 | 36.6 |
| JJ | Fremont | Milpitas | 31.7 | 40.7 |
| TK | Fresno | Fresno | 25.7 | 37.2 |
| NC | Geyserville | Santa Rosa | 26.1 | 36.3 |
| VF | Gilroy | Cupertino | 31.6 | 40.7 |
| HM | Grass Valley | Auburn | 24.5 | 35.9 |
| FD | Gridley | Marysville | 26.8 | 37.8 |
| RH | Half Moon Bay | Colma | 31.5 | 40.3 |
| JK | Hayward | Milpitas | 31.7 | 40.9 |
| BG | Hollister | Cupertino | 31.6 | 40.9 |
| XD | Jackson | Angels Camp | 26.3 | 36.5 |
| BJ | King City | Salinas | 32.3 | 41.8 |
| HD | Lincoln | Auburn | 24.5 | 35.4 |
| JN | Livermore | San Ramon | 26.4 | 36.5 |
| TM | Los Banos | Fresno | 25.7 | 37.3 |
| VJ | Los Gatos | Cupertino | 31.6 | 40.6 |
| TN | Madera | Fresno | 25.7 | 37.4 |
| XH | Manteca | Stockton | 24.0 | 35.9 |
| HP | Marysville | Marysville | 26.8 | 37.8 |
| TR | Merced | Stockton | 24.0 | 35.4 |

[1] The sum of 48 ½-hr temperature readings for a day divided by the number of readings at PG&E's Load Management Weather Stations.

[2] Abnormal Peak Day (APD) is the coldest temperature that is expected to be met or exceeded once within a 90-year period. This corresponds to a system weighted mean temperature of 29°F.

[3] Cold Winter Day (CWD) is the coldest day that can be expected during the winter season. CWD is modeled using 75 percent of temperature-dependent customers' projected APD daily loads.

# APD and CWD Mean Daily Temperatures [1]

| Office Code | Billing Office | Weather Station | APD Temperature [2] (deg F) | CWD Temperature [3] (deg F) |
|---|---|---|---|---|
| XJ | Modesto | Stockton | 24.0 | 35.4 |
| BM | Monterey | Salinas | 32.3 | 41.6 |
| NL | Napa | San Rafael | 29.8 | 39.2 |
| XL | Newman | Stockton | 24.0 | 36.1 |
| XN | Oakdale | Stockton | 24.0 | 35.6 |
| JQ | Oakland | Oakland | 29.5 | 39.6 |
| FJ | Orland | Chico | 28.1 | 39.5 |
| FQ | Oroville | Chico | 28.1 | 39.0 |
| FM | Paradise | Chico | 28.1 | 38.0 |
| NN | Petaluma | Santa Rosa | 26.1 | 36.6 |
| HT | Placerville | Auburn | 24.5 | 33.8 |
| FN | Red Bluff | Red Bluff | 25.4 | 36.5 |
| FY | Redding | Red Bluff | 25.4 | 36.9 |
| JT | Richmond | Oakland | 29.5 | 39.2 |
| TD | Ridgecrest | Bakersfield | 25.1 | 36.5 |
| HS | Roseville | Sacramento | 27.0 | 37.6 |
| PS | Sacramento | Sacramento | 27.0 | 37.9 |
| BT | Salinas | Salinas | 32.3 | 41.4 |
| RG | San Francisco | Potrero | 32.7 | 42.8 |
| VP | San Jose | Milpitas | 31.7 | 40.9 |
| NQ | San Rafael | San Rafael | 29.8 | 39.0 |
| VT | Santa Cruz | Santa Cruz | 32.0 | 40.9 |
| NR | Santa Rosa | Santa Rosa | 26.1 | 36.6 |
| TT | Selma | Fresno | 25.7 | 37.4 |
| NV | Sonoma | Santa Rosa | 26.1 | 36.5 |
| XT | Stockton | Stockton | 24.0 | 35.6 |
| TV | Taft | Bakersfield | 25.1 | 36.9 |
| BR | Templeton | Paso Robles | 25.1 | 35.2 |
| XV | Tracy | Stockton | 24.0 | 35.1 |
| XX | Turlock | Stockton | 24.0 | 35.3 |
| NX | Ukiah | Ukiah | 24.5 | 35.1 |
| PK | Vacaville | Sacramento | 27.0 | 37.5 |
| NY | Vallejo | San Rafael | 29.8 | 38.9 |
| TX | Wasco | Bakersfield | 25.1 | 41.8 |

[1] The sum of 48 ½-hr temperature readings for a day divided by the number of readings at PG&E's Load Management Weather Stations.

[2] Abnormal Peak Day (APD) is the coldest temperature that is expected to occur once within a 90-year period. This corresponds to a system weighted mean temperature of 29°F.

[3] Cold Winter Day (CWD) is the coldest day that can be expected during the winter season. CWD is modeled using 75 percent of temperature-dependent customers' projected APD daily loads.

# 4. RECOMMENDED OPERATING PROCEDURES

This section of the guide includes specific recommendations for operating critical local gas transmission facilities. This information reflects an integration of operations policies and procedures, facilities design assumptions, and the results of design-day modeling. New information has been incorporated where appropriate to reflect changes that have recently been adopted as a result of systems engineering analyses. Unless otherwise stated, the operating procedures were developed for winter operations.

## NORTHERN AREA



## SOUTHERN AREA

# ***NORTHERN AREA***

## Recommended Operating Procedures
## Winter 2009 - 2010

## *NORTH COAST,NORTH BAY, and SACRAMENTO DIVISION (Fairfield and Vacaville)*

**L210/21 System:**
The L210/21 system is constrained under Abnormal Peak Day (APD) loading conditions on L21 at Monroe Reg Station in Santa Rosa. In addition, operation of the Santa Rosa Compressor is required to avoid further curtailments and local capacity constraints under stage 1 loading conditions (31 $^{o}$F) or colder. If forecasts predict temperatures approaching stage 1 loading conditions for the next day, both compressor units should be started no later than 11:30 P.M. and run until **no later than 5:30 A.M.**

**COLD WINTER DAY**

1) Operate Napa Y Meter Station at pressure high enough to maintain a minimum of 210 psig inlet at Monroe Station in Santa Rosa.

**STAGE 1 OPERATIONS**

1. Operate both Santa Rosa Compressor units (K-1 & K-2) from 11:30 pm to 5:30 am

**ABNORMAL PEAK DAY**

1) Operate Napa Y Meter Station as close as possible to 450 psig MAOP. Maintain a minimum of 210 psig inlet at Monroe Station in Santa Rosa.

2) Operate both Santa Rosa Compressor units (K-1 & K-2) from 11:30 pm to 5:30 am.

3) Issue a Stage 2 Curtailment Order

**L177 Humboldt System:**
The L177 system is constrained when the Humboldt Bay Power Plant (HBPP) is at 100% usage and temperature falls below 50 $^{o}$F (average daily temp., 43% APD)

1) **Cold Fall Day:**
   - When HBPP is at 100% usage and temperature falls below 50 $^{o}$F (average daily temp., 43% APD), system constraints should be managed with cooperation by Power Trading (PT) in limiting plant demand to correspond to system capacity at various temperatures and Gerber pressures (allowable burn rates spreadsheet). A 2$^{nd}$ set of allowable burn rate tables exist for the 2008-09 winter that can be used for higher burn rates at HBPP while Evergreen Pulp is closed for business. PT advance notification of intended use and real time HBPP usage along with forecast Eureka/Arcata temperatures from Meteorology "Power Control Sheet" should be used in conjunction with the allowable burn rates spreadsheet and graphs to verify adequate capacity.

   - If HBPP use significantly exceeds that allowed by the allowable burn rates spreadsheet or system pressures approach CWD minimums, monitor system to determine if HBPP curtailment is needed. (Monitor Cummings Creek inlet pressure to detect packing or drafting, L177 Tompkins Hill M-1 flow, and L137 Arcata Sta. inlet pressure). Curtailment orders should be issued to PT @ 8-223-5789 in increments of 15MW[2] until the gas system recovers.

2) **Cold Winter Day:**
   - Perform Cold Fall Day operating procedures.

   - Maintain a minimum pressure at Gerber Station of 800 psig into Line 177

   - Minimize regulator set point difference between lead and standby runs at Cummings Creek and Tompkins Hill stations.

3) **Abnormal Peak Day:**
   - Perform Cold Fall Day and Winter Day operating procedures

   - If required, curtail HBPP up to 100%

[1]Temperature obtained from averaging the Eureka min. & max. forecast temperature on the Meteorology "Power Control Sheet"

[2] HBPP generation capability from natural gas is 105 MW. Assuming 105MW is equivalent to 1.26 MMCFH, a 15 MW reduction should be approximately equivalent to a gas flow reduction of 0.18 MMCFH.

**Vacaville 400# DFM System:**
The Vacaville South 400# DFM system is constrained under Abnormal Peak Day (APD) loading conditions at Marshall Road Reg Station in Vacaville

1) **Abnormal Peak Day:**
    - Raise Hawkins and Lewis Primary Reg Station in Elmira/Vacaville from 380 to 390 psig.

    - Issue a Stage 2 Curtailment Order

# Recommended Operating Procedures
# Winter 2009 - 2010

## *SACRAMENTO VALLEY LOCAL TRANSMISSION SYSTEM*

**Normal Winter Day:**

- Operate Hershey Jct at 550-750 psig to allow Wild Goose Storage to place volumes onto the system *(SGC)*
- NO Wild Goose Storage Injection from L167
- Operate Lincoln Jct to supply L123 as close to 500 psig MAOP as possible *(Sierra)*
- Operate Roseville Rd DFM as close to 175 psig MAOP as possible at Antelope Meter Station *(Sac)*
- Operate L123 Baseline Rd MLV 3.42 in the CLOSED position *(BNO)*
- Operate Mather DFM as close to 240 psig MAOP as possible at 20th & MLK Meter and Reg Station *(Sac)*
- Operate the 260# Floater DFM to supply the NSAC 180# DFM across V142 *(Sac)*
- Transfer the supply to Stockton from Las Vinas to Vernalis (STK)

**Cold Winter Day:**

- Schedule Wild Goose Storage Withdrawals into L167 as a FIRST PRIORITY receipt point to L400 *(SGC)*
- Operate Hershey Jct at 795# *(SGC)*
- Cycle the North Sac Underground Holder to supply NSAC 180# DFM *(BNO)*
- Operate L403 at 775# across V24 at Creed Station *(BNO)*
- Prepare to OPEN Baseline Rd MLV 3.42 to flow NORTH ***if*** Wild Goose Storage withdrawal volumes < 40 MMcf/day, ***OR;***
- Prepare to dispatch the L173 LNG trailer ***if*** Wild Goose withdrawals < 40 MM/day and the Baseline Rd MLV 3.42 SOUTH pressure is lower than the NORTH Pressure

**Stage 1:**

- Schedule up to 100 MMcf/d Wild Goose Storage Withdrawals into L167 as a FIRST PRIORITY receipt point to L400 *(SGC)*
- Prepare to dispatch L173 LNG trailers if Wild Goose withdrawals < 80 MM/day, and/or demand is expected to be +110% of Stage 1 *(Sierra)*
- Prepare to OPEN Baseline Rd MLV 3.42 to flow NORTH ***if*** Wild Goose Storage withdrawal volumes < 80 MMcf/day, OR to flow SOUTH if demand is expected to be +110% of Stage 1 *(Sac)*

**Stage 2: APD with Noncore Customers**

- Schedule up to 116 MMcf/d Wild Goose Storage Withdrawals into L167 as a FIRST PRIORITY receipt point to L400 *(SGC)*
- Prepare to dispatch L173 LNG trailers *(Sierra)*
- Prepare to OPEN Baseline Rd MLV 3.42 to flow SOUTH *(Sac)*
- Prepare to dispatch personnel to man and by-pass Barton Rd DFM Reg Station R-411 to hold 59# d/s (Sierra)
- Curtail Noncore Customers in the AUBURN, NSAC, FOLSOM and LODI zones.

**Anormal Peak Day Plus :**

- Dispatch L173 LNG trailers *(Sierra)*
- Operate L123 Baseline Rd MLV 3.42 in the CLOSED position *(BNO*
- Prepare to dispatch personnel to man and by-pass Barton Rd DFM Station R-411 to hold 59# d/s (Sierra)
- Issue Full APD Curtailment Orders *(TSP)*

- Schedule up to 98 MMcf/d Wild Goose Storage Withdrawals into L167 as a FIRST PRIORITY receipt point to L400 *(SGC)*

**CRITICAL CUSTOMERS TO MONITOR**

| **Sierra Division** | **Sacramento Division** |
|---|---|
| • Sierra Pine LTD, Rocklin (MasterLink) | • SMUD McClellan Park Cogen, North Highlands (MasterLink) |
| • NCPA, Roseville (MasterLink) | • California State Prison, Folsom (98113) |
| • Rio Bravo, Rocklin (Masterlink) | • Aerojet General , Rancho Cordova (98023, 98025) |
| • DST Cogen, El Dorado Hills (MasterLink) | |
| • City of Roseville REP (Masterlink) | |

| **Stockton Division** |
|---|
| • General Mills |
| • NCPA, Lodi |

# Recommended Operating Procedures
# Winter 2009 - 2010

## *NORTH VALLEY DIVISION*

**LINE 177 / DFM-8 KENNEDY BACKTIE -** The northern part of the Chico distribution system was reinforced in 1991 to support peak winter loads by installing the Kennedy backtie (Reg H-56 on DFM-8) off of Line 177. In 2003, setpoints were set for Reg H-56 and Reg H-62 at Butte Station which only allows flow from Reg H-56 under APD load conditions. Throughout the rest of the year, , Chico is supplied with L177 and L136 gas out of Butte Station to place low BTU gas from Durham Field.

**NORMAL SUMMER OPERATIONS (April 1 - October 31)**

1. R-H56 (end of DFM-8) set to feed at 50 psig
2. R-H-62 (Butte Station) set to feed at 55 psig

**NORMAL WINTER OPERATIONS (November 1 – March 31)**

Same as Normal Summer Operations

**ABNORMAL PEAK DAY OPERATIONS**

Same as NORMAL WINTER OPERATIONS.

# Recommended Operating Procedures
# Winter 2009 - 2010

## *SACRAMENTO DIVISION*

**HERSHEY JUNCTION** Depending on local load conditions and Wild Goose Storage operations, L172 North will operate between 550 psig and 795 psig out of Hershey Jct.

**NORMAL WINTER OPERATIONS**

L172N and L172S must operate at 650-750 psig under near Cold Winter Day Conditions. Under Cold Winter Day Conditions, operate Hershey Jct at 795 psig if Wild Goose Storage withdrawal rates are below 100 MMcf/d

**ABNORMAL PEAK DAY OPERATIONS**

L172N and L172S should operate as close to 795 psig as possible under near APD conditions in order to minimize the amount of local capacity curtailments.

**LINE 210(E) AND LINE 403 AT CREED STATION -** 16" L210(E) and 16" L403 are normally operated as separate lines with crosstie valves V-11 and V-13 at Rio Vista "Y" closed. Under normal winter conditions, 16" L403 is operated to float with 32" L210 to (a) provide support into 32" L210 when L403 Creed pressures are above 650 psig and to (b) receive support from 32" L210 when L403 Creed pressures drop below 650 psig. 16" L210(E) is normally operated to provide support into L196 at pressures between 725 psig and 775 psig at Creed Station.

**NORMAL WINTER OPERATIONS**

Operate Creed Station to allow 16" L403 to float with 32" L210 and to provide support into L196 out of Creed Station via 16" L210(E) at between 725 psig and 775 psig.

**ABNORMAL PEAK DAY OPERATIONS**

If the Sacramento Valley local transmission system is experiencing near APD conditions (mean daily temperature of **28.6 Deg F** for the Sacramento Billing Office weather station) and demand is expected to increase over the next day, 16" L403 should be set to operate at 790 psig for a period of three to five days.

Operate Creed Station at 775 psig and a minimum pressure of **760 psig** into 16" L403.

**Creed Station**

1. Increase the backpressure setpoint for V8 from **650 psig** to 800 **psig** so it will remain closed

2. Open the new crosstie valve between 16" L403 and 16" L210(E)

3. Adjust the setpoint for V9 to maintain **775 psig** into 16" L210(E) / 16" L403

**NORTH SACRAMENTO HIGH PRESSURE UNDERGROUND HOLDER -** The station was rebuilt in 2001 to accommodate the uprate of Line 119W from 500 psig to 720 psig. As a result of this work, gas flows from uprated 720 psig L119W through V134 and V134R into parallel 500 psig 12" L119E and 16" L119E east to Roseville Rd Regulator Station. The uprate of Line 119W from 500 psig to 720 psig required leaving valve V132 in the Normally OPEN position and valve V135 in the Normally CLOSED position as an MAOP separation valve throughout the year. And valves V136 and V136R operate in the wide-open position throughout the year.

**NORMAL WINTER OPERATIONS**

Set the 12" 260 psig DFM to lead L119W as the primary feed into the North Sacramento 180 psig DFM.

**12" 260 psig DFM set as primary feed into NSAC 180 psig DFM**

1. Verify open V-98 and V-131
2. Set V-93 and V-142 to feed at **170 psig**
3. Verify V-167 and V-168 are set to feed at **160 psig**

**ABNORMAL PEAK DAY OPERATIONS**

# Recommended Operating Procedures
# Winter 2009 - 2010

## *SIERRA DIVISION*

**BASELINE ROAD MLV 3.42 –** The valve is to remain CLOSED throughout the year, except during the peak morning hours (0600-1100 hrs) during greater than Stage 1, or higher local load conditions or as directed by Transmission System Planning.

**NORMAL WINTER POSITION** – CLOSED.

**COLD WINTER DAY OPERATIONS** CLOSED.
**ABNORMAL PEAK DAY POSITION – CLOSED.**

**AUBURN REGULATOR STATION / L173** - Should local weather and load conditions exceed CWD levels, the minimum pressure at the end of L173 may become constrained.

**ABNORMAL PEAK DAY OPERATIONS -** Follow the "Peak Shaving Cold Weather Callout Plan" in Section 6 to dispatch the portable LNG Peak-load Shaving trailer at the end of L173 in Auburn to maintain a minimum pressure of 90 psig in L173, or that pressure necessary to maintain a minimum control pressure of 59 psig in the Auburn distribution system during the morning peak hours.

**Lead Time to Dispatch** Every attempt will be made by TSP to make a determination and issue a recommendation to dispatch the portable LNG trailers to the Auburn Regulator Station at least 18 hours prior to PG&E's estimated time of operation. However, shorter notice may be necessary under certain circumstances.

# Recommended Operating Procedures
# Winter 2009 - 2010

## *STOCKTON DIVISION*

**NORMAL SUMMER OPERATIONS (3/20 – 11/20)**

Supply Stockton out of Las Vinas Station:

1. Close Line 108 French Camp Rd MLV 22.31
2. Open Line 108 8-Mile Rd MLV 36.10
3. Set Therm Billing Area X02 = X05

**NORMAL WINTER OPERATIONS (11/20 – 3/20)**

Supply Stockton out of Vernalis Station:

1. Open Line 108 French Camp Rd MLV 22.31
2. Close Line 108 8-Mile Rd MLV 36.10
3. Set Therm Billing Area X02 = X03

- Maintain a minimum of 300 psig at Las Vinas Station inlet.

**STAGE 1 OPERATIONS**

- Set Creed, L210E, to 775#.

**STAGE 2 OPERATIONS**

- Set Creed, L210E, to 775#.

# Recommended Operating Procedures
# Winter 2009 - 2010

## *DIABLO DIVISION*

### NORMAL WINTER OPERATIONS

Operate L-191S feed at SP3/L191 Crosstie at 300 psig minimum pressure

### COLD WINTER DAY

- Walnut Ave. Regulator supports Concord DFM from L-191S (BTU Mix)
- Operate L-191S feed at SP3/L191 Crosstie at 335 psig minimum pressure

### ABNORMAL PEAK DAY

- Walnut Ave. Regulator supports Concord DFM from L-191S (BTU Mix)
- Operate L-191S feed at SP3/L191 Crosstie at 335 psig minimum pressure
- Manually bypass Plaza Station and throttle valve at 180 psig to support Moraga area DFM's from Line 191 and C Street Station.
- Manually bypass Distribution Regulator RW-13 (Danville DFM) as necessary
- Fully curtail St. Mary's college in Moraga

# Recommended Operating Procedures
# Winter 2009 - 2010

## *EAST BAY DIVISION*

**NORMAL WINTER OPERATIONS**

No operations are necessary for the transmission system.

**COLD WINTER DAY**

No operations are necessary for the transmission system.

**ABNORMAL PEAK DAY**

No operations are necessary for the transmission system.

# Recommended Operating Procedures
# Winter 2009 - 2010

## *MISSION DIVISION*

**NORMAL WINTER OPERATIONS**

No operations are necessary for the transmission system.

**COLD WINTER DAY**

- Maintain a 400 psig minimum inlet pressure from L-131 at Isabel Station (per Design Criteria Alarm setting)

**ABNORMAL PEAK DAY**

- Maintain a 400 psig minimum inlet pressure from L-131 at Isabel Station (per Design Criteria Alarm setting)
- Maintain 325# at the Irvington Mixer

# ***SOUTHERN AREA***

## Recommended Operating Procedures
## Winter 2009 - 2010

### *SAN FRANCISCO, PENINSULA, DE ANZA & SAN JOSE DIVISIONS (NORTH)*

**NORMAL WINTER OPERATIONS**

No operations necessary.

**COLD WINTER DAY**

- Operate Milpitas Station above 365# to maintain a minimum of 157 psig inlet at Sullivan and Martin Stations and 177 psig at Lomita Station.

- Operate N. 1st & Tasman (E05 – San Jose) at 190 psig.

- Operate Walsh & L109/132 (C-21 Peninsula) at 225 psig.

- Operate Whisman & Central Expressway (B-34 – DeAnza) at 175 psig and Lawrence Expressway & Lakehaven (C-20 – DeAnza) at 177 psig.

- Operate Middlefield DFM at 120 psig

**STAGE 2**

- Perform CWD operations.

- Open L109/L132 crossties in the following order:

  1) Healy Station (op. diagram 087221), valves 1, 2, 3, & 4
  2) Ralston Ave. Crossover (op. diagram 082534), valves 283 & 284
  3) Crystal Springs Crossover (XO 31.92 & XO 31.95)
  4) Martin Station Cross-tie (Op. Diag 081628) V-19

- Curtailment of noncore customers in SF Zone 1 may be needed .
- Prepare to bypass Reg. Sta. R-170
- Prepare to bypass Reg. Sta. D-04 in Cupertino
- Prepare to bypass Reg. Sta. E-23 in Santa Clara

  Prepare to bypass California Paperboard in Santa Clara

# Recommended Operating Procedures
# Winter 2009 - 2010

## *SAN JOSE DIVISION (SOUTH)*

**NORMAL WINTER OPERATIONS**

No changes from current operations

**COLD WINTER DAY**

- Maintain a minimum pressure at Milpitas Station of 365 psig
- Maintain a minimum pressure of 350 psig into the Fontanoso DFM.
- Set outlet pressure at Cochrane DFM to 308 psig
- Set outlet pressure at Diana DFM to 247 psig
- Set outlet pressure at Church DFM to 330 psig
- Set outlet pressure at Roop DFM to 118 psig
- Set outlet pressure at Tully DFM to 247 psig

**STAGE 2**

- Stand by and prepare to bypass
    - Reg. Sta. D-24 in Los Gatos
    - Reg. Sta. D-26 in Los Gatos .
    - Reg Sta D-04 in Cupertino
    - Reg Sta E-23 in Santa Clara

# Recommended Operating Procedures
# Winter 2009 - 2010

## *CENTRAL COAST DIVISION*

NORMAL WINTER OPERATIONS (Before December 1st)

- Feed King City DFM from L-310 by setting Metz Rd set pressure to 125 psig and Jolon Rd's set pressure to 115 psig.
- Maintain a minimum pressure of 530 psig at Tres Pinos.
- Switch Calpine Monterey to L181A.

LEASED COMPRESSOR UNIT (Scheduled to be on site by Dec. 1st)

The leased compressor unit will need to be operated for cold weather conditions beyond CWD (ADT colder than 40 deg F). The compressor is manually operated and requires 24 hour prior notice. Notify the Peak Shaving Manager, Austin Hastings at 559-246-0485 for current Operator Callout Procedures. Utilize the attached link for after hours callout. (http:/www/gsm/Library/lng.htm) If the holder feeds, the compressor should not be operated before the DFM pressure is greater than 190# and no sooner than one hour after the holder has finished feeding.

EXISTING COMPRESSOR UNIT

The existing compressor should only be used if the leased compressor is not operating correctly or if the CWD conditions happen prior to Dec. 1st. Curtailments will be required, see the Stage 1 and Stage 2 operations below.

STAGE 1 OPERATIONS

- Assure that the following station set pressures are set correctly.
    - Rob Roy – 298 psig
    - Bolsa – 345 psig
- Zone MLPP may need curtailments regardless of compressor operations.
- Zones SCRUZ, CAPITOLA, and L181A_B, noncore curtailments of 66% allowable may only be needed if the leased compressor unit is not operating correctly or prior to December 1st.

STAGE 2 OPERATIONS

- Assure that the following station set pressures are set correctly.
    - Rob Roy – 298 psig
    - Bolsa – 345 psig
- Zone MLPP may need curtailments regardless of compressor operations.
- Zones SCRUZ, CAPITOLA, and L181A_B, noncore curtailments of 25% allowable may only be needed if the leased compressor unit is not operating correctly or prior to December 1st.

# Recommended Operating Procedures
# Winter 2009 - 2010

## *YOSEMITE DIVISION*

**LINE 108, French Camp Road, V-22.31 -** Valve 22.31 is now normally open. This is no longer to be a BTU separation valve during winter months.

Line 108, Eight Mile Road, V-36.10 – This is now the BTU separation valve. It is to be normally closed.

**Pecos & Herndon BTU Valve –** Normally open year-round.

**Morgan & Whitmore BTU Valve** - Regulation at this location should be set at 240 psig year-round.

**V-60.45, LINE 118 -** This valve is normally closed to separate two BTU areas. Valve 60.45 can be remotely operated using SCADA. Valve should be opened during CWD and colder conditions.

**Vernalis Tap –** Pressure should be a minimum of 525 psig. Minimum pressure needs to be 625 psig under Design Criteria conditions

**Oak Flat Rd Meter Sta, LINE 215 –** Minimum pressure needs to be 675 psig into L-215 for normal winter operations. Minimum pressure needs to be 750 psig for CWD and colder conditions.

**Bradbury Reg Sta, Line 118 -** The set pressure into L-118 should be set as near MAOP (400 psig) as possible.

**Los Banos DFM** – Uprated in October 2004 to 395 psig MAOP. Operating at 350 psig.

**West Ave Reg Station** – Set pressure should be as near MAOP (260 psig) as possible.

**McMullin Ranch Station** – Set point into L-148 should be as near MAOP (408 psig) as possible.

**Ripon Modesto Meter Station** – Set pressure should be as near MAOP (408 psig) as possible.

**Ripon Cogen Meter Lot** – Set pressure into the Ripon Modesto DFM should be as near MAOP (408 psig) as possible.

**Coffee Claratina Reg Station** – Set pressure in the Modesto HP Feed should be set as near MAOP (260 psig) as possible.

# Recommended Operating Procedures
# Winter 2009 - 2010

## *FRESNO DIVISION*

**NORMAL WINTER OPERATIONS (NOV 1 – MARCH 31):**

**HELM TAP** - Normal winter operating pressure at Helm Tap is 650 psig. This is lowered to 550 psig outside of the winter timeframe to allow for greater backbone operational flexibility.

**FRESNO JUNCTION** Set regulation supplying Line 118-N at 395 psig or higher (MAOP is 400 psig).

**HELM JCT** – Set regulation feeding L-111 at 645 psig or higher (MAOP is 650 psig).

**ELKHORN STATION** – Set regulation feeding L-138 at 645 psog or higher (MAOP is 650 psig).

**FRESNO DFM -** three regulator stations feed the Fresno DFM System: The Fresno Gas Load Center, Chestnut and Clay, and Tarpey. Regulation at the Load Center , Tarpey, and Chestnut and Clay should be set at or near 195 PSIG year round.

**L134 – HERNDON JCT** – Regulation set at 365 PSIG to feed from L134 into L118N at Herndon Junction during the winter months

**COLD WEATHER EVENT OPERATIONS (BEYOND CWD):**

**HELM TAP** – Regulation feeding L-138A and B should be set to feed as close to possible to 700 psig during a Cold Weather Event.

**L 118 -** Open V-60.45 from the Brentwood Gas Control Center. Notify Yosemite Division on-call supervisors.

**VERIFY** all other regulation settings as specified above.

**EMERGENCY PROCEDURES (LINE RUPTURE/ DIG-IN/LINE FAILURE)**

**L-138:**

1. Leak isolation by T&R Department(s).
2. Concurrent with leak isolation, System Gas Control assesses the immediate situation, confers with Fresno Division T&R and TSP Planning Engineer if feasible, and establishes a backfeed to L-138 if required. L-351 provides an alternate feed to the Fresno area. If the leak is downstream of L-351/L-138 junction, a backfeed can be established via System Gas Control and Brentwood Control Center through normally closed V-111. Valve 14 at Fresno Jct should also be remotely raised to 400 psig if required.

**L-118:**

1. Leak isolation by T&R Department(s).
2. Concurrent with leak isolation, System Gas Control assesses the immediate situation, confers with Fresno and Yosemite Division T&R and GSO-TSP Planning Engineer if feasible, and establishes a backfeed to L-118 as required. The backfeed is established via System Gas Control and Brentwood Control Center through normally closed BTU isolation V-60.45. Regulation at Herndon Jct. From L-134 into L-118 can also be raised from normal setpoint of 365 PSIG at V-10 to L118's MAOP of 400 PSIG.

**L-111:**

1. Leak isolation by T&R Department(s).
2. L-351 provides an alternate feed to L-111/L-118. If the leak is downstream of L-351/L111 junction, after isolation, a backfeed can be established by opening V-60.45.

# Recommended Operating Procedures
# Winter 2009 - 2010

## *KERN DIVISION*

**NORMAL WINTER OPERATIONS (NOV 1 – MARCH 31):**

Maintain 400 psig at Lucerne Tap into L-313 unless flow is greater than or equal to 0.8 MMCFH, then maintain 475 psig.

Maintain 397 psig into L-314 unless flow is greater than or equal to 1.23 MMCFH, then maintain 510 psig.

**COLD WEATHER EVENT OPERATIONS (BEYOND CWD):**

Maintain 475 psig at Lucerne Tap into L-313 under conditions beyond CWD.

Maintain 510 psig to L-314 under conditions beyond CWD.

# 5. LOCAL CAPACITY CURTAILMENT PROCESS

**Issues** PG&E may find it necessary to implement Local Curtailments if demand is projected to exceed the capacity on a local gas transmission or distribution system. During periods of unusually cold weather, local noncore end-use customers may be required to curtail gas usage in order to ensure that local core demand is met. Local Curtailments may also be called when a pipeline has been damaged and supply deliveries are threatened. Local Curtailments are intended to reduce physical demand on the affected pipeline. Unless Involuntary Diversions are in effect at the same time, a customer's supply will not be diverted. Gas Rule 14 defines provisions for Local Curtailments.

**Design Requirements** PG&E's local transmission and distribution pipeline systems have been designed to meet the following design criteria: Cold Winter Day (CWD) & Abnormal Peak Day (APD)

**Curtailment Stages** There are three stages for Local Curtailments: Stage 1: Conditions between CWD and APD Stage 2: Temperatures at or near APD Stage 3: Temperatures colder than APD or if local area operational problems occur.

**Curtailment Criteria** All noncore end-use customers are designated to be within specific curtailment zones. Depending on conditions within a specific zone, all noncore end-use customers within that zone will generally be required to curtail usage on a pro rata basis. Different stages of curtailment may be in effect in different zones. PG&E determines which noncore customers are asked to curtail usage during Local Curtailments based on the following criteria:

- curtailment zone affected
- volume of gas to be curtailed
- severity of the conditions
- need for additional load reduction or curtailment in additional zones

**Process** The updated Local Curtailment Process can be found at: http://uo/EO/GTD/GSO/GasControl/curtailments.htm **[to be updated 12/1/09]**

**Curtailment List** A master customer list has been developed for the winter that will be used to determine curtailments, in the event they are necessary. This list is maintained on a shared directory at:

\\fairfield07\TSP\Winter_Operating_Guide\Local_Curtailment_List.xls

During a curtailment event, this master list will be used as the basis for the event-specific curtailment list that will contain only the customer information (Transportation ID, Name, Address, Account Number, etc.), curtailment zone, and allowed hourly usage specified in MCF/hr.

# *APPENDIX A - LNG COLD WEATHER CALLOUT PLANS*

Please contact the LNG Program Manager, Austin Hastings, at 821-5165 for current LNG Callout Procedures. Utilize the attached link for after hours callout.

***http://www/gsm/Library/lng.htm***

# PG&E GAS SCADA SYSTEM

## Alarm Limits

## Policy and Procedures

The Policy and Procedures described in the following text were developed to ensure the safe operation of PG&E's natural gas system and to maintain its integrity. The responsibility for establishing alarm settings, changing alarm settings, and responding to alarms is described herein. In some cases, the procedure will refer to references in the Appendices for an appropriate action. Throughout this document, all underlined terms will have definitions which are listed on the final pages.

## *Alarm Policy*

All transmission system pressure points (including station inlet and outlet piping) will have established Hi-Hi and Lo-Lo alarms.

All high pressure distribution system (60 psig and below) pressure points will have established Hi-Hi, [No Hi alarms are set], Lo, and Lo-Lo alarms.

All low pressure distribution system (inches water column) pressure points will have established Hi-Hi, Hi, Lo and Lo-Lo alarms.

Hi-Hi flow alarms will be set for selected transmission system flow points. Lo-Lo flow alarms will be set on lines that do not normally shut-in and on selected single feed transmission system lines. Distribution Hi-Hi and Lo-Lo flow alarms will be set based on discussions between Gas Control and the responsible Field M&C Personnel.

Gas quality Hi-Hi and Lo-Lo alarms will be determined by the Gas Quality Response Team Lead.

All Gas SCADA system digital points will have established alarm limits and will be managed by the Gas SCADA System Digital Alarm Policy and Procedures (See **Appendix A**).

All new or revised Hi-Hi and Lo-Lo limits must be authorized as outlined in the SCADA Alarm Settings table (See **Appendix B**). Additions or changes to High Pressure Distribution System Lo alarm settings and Low Pressure Distribution System Hi and Lo alarm settings must also be authorized. All revisions to the Hi-Hi and Lo-Lo alarm settings must follow the Gas SCADA, Alarm Change Procedure (See **Appendix C**, *Gas SCADA Alarm Change Procedure*).

As data points are added or deleted to either the transmission or distribution systems, the SCADA Engineer will follow established procedures (See **Appendix D**, *Gas SCADA Policy and Implementation of Alarm Limit Settings for New Gas SCADA Points*). With certain exceptions Hi and Lo alarms will be set at the discretion of the Transmission Coordinators and/or Gas System Operators to monitor the normal operating range of the system. Exceptions are noted in the Alarm Settings, below.

## *Alarm Settings*

### Pressure

#### Hi–Hi and Lo-Lo Alarm Limits

**Transmission System**

All transmission system pressure points (including inlet and outlet piping at transmission stations) will have established Hi-Hi and Lo-Lo alarms. Hi-Hi alarms will not be set above the lower of Maximum Allowable Operating Pressure (MAOP) plus 3 pounds per square inch (psi) or Maximum Operating Pressure (MOP) plus 3 pounds per square inch (psi). Lo-Lo alarm limits will not be set below the Minimum Required Pressure (MRP) less 3 psi (Transmission systems frequently run at the MOP or MRP. Hi-Hi alarms are set 3 psi above MOP and Lo-Lo alarms are set 3 psi below MRP. (See **Appendix E**, *L-300 Operating Parameters and Hi-Hi Alarm Settings*, for L-300 alarm setpoints affected by elevation change).

**High Pressure Distribution Systems (60 psig and below)**

Hi-Hi pressure alarms will be set at Maximum Allowable Operating Pressure (MAOP) The Lo-Lo pressure alarms limits will be set at the Minimum Required Pressure (MRP) less 2 psi. All Hi-Hi, Lo and Lo-Lo alarms are established by the Principal Engineer of Gas Measurement/Gas Quality Engineering, or designee, and may not be changed at operator discretion. There are no longer Hi alarms set for High Pressure Distribution Systems.

**Low Pressure Distribution Systems (inches water column)**

Unless otherwise noted (See **Appendix B**, *SCADA Alarm Settings table*), the Low Pressure Distribution System alarms will be set as follows:
Hi-Hi pressure alarms will be set at 12 inches water column.
Hi pressure alarms will be set at 10.5 inches of water column.
Lo pressure alarms will be set at 5 inches of water column.
Lo-Lo pressure alarms will be set at 4 inches water column.

## Pressure

### Hi and Lo Alarm Limits

**Transmission System**

Hi and Lo pressure alarms will be set to monitor the normal operating range of the system being monitored. Hi pressure alarms will be set at or below the MOP. Lo pressure alarms will be set above the MRP. During cold weather Design Day events, Lo pressure alarms will be set as outlined in the Design Criteria Alarm Policy (See **Appendix F**, for the *Design Criteria Alarm Policy (Cold Weather Alarms)*).

**High Pressure Distribution Systems (60 psig and below)**

Lo pressure alarms will be set at the MRP. There are no longer seasonal adjustments for Lo alarm settings. All Lo alarms are established by the Principal Engineer of Gas Measurement/Gas Quality Engineering, or designee, and may not be changed at operator discretion. *There are no longer Hi alarms set for High Pressure Distribution Systems.*

**Low Pressure Distribution Systems (inches of water column)**

Hi pressure alarms will be set at 10.5 inches water column (See **Appendix G**, *Temporary Exceptions to Alarm Setpoint Criteria*). Lo pressure alarms will be set at 5 inches water column. There are no seasonal adjustments for the Hi and Lo alarm settings. Hi and Lo alarms are established by the Principal Engineer of Gas Measurement/Gas Quality Engineering, or designee, and may not be changed at operator discretion.

## Flow

### Hi–Hi and Lo-Lo Alarm Limits

**Transmission System**

Hi-Hi flow alarms will be set for selected transmission flow set points. Lo-Lo alarm flow limits will be set on lines which do not normally shut in and on selected single feed transmission lines. Hi-Hi and Lo-Lo alarms will be set resulting from a discussion and agreement between Gas Control , TSP, and the responsible Field M&C Personnel.

**Distribution Systems**

Hi-Hi and Lo-Lo alarms will be set resulting from a discussion and agreement between Gas Control , GT&D Gas Engineering Personnel, and the responsible Field M&C Personnel.

## Gas Quality

### Hi-Hi and Lo-Lo Alarm Limits

Gas quality Hi-Hi and Lo-Lo alarm limits will be set based on the recommendation by the Gas Quality Response Team Lead.

### Temporary Alarm Settings during Clearance Work

**Hi-Hi and Lo-Lo Alarm Limits (Pressure, Flow, Gas Quality)**

During clearances it may be necessary to temporarily change Hi-Hi and Lo-Lo alarm limits to settings other than those normally specified (See **Appendix H**, *Alarm Setpoints During Clearance Work*).

## *Alarm Review*

Alarm limits will be reviewed during October of each year. Upon completion of the review, Gas Control will implement the requested alarm limits in mid-November.

### Transmission System

**Hi-Hi and Lo-Lo Alarm Limits (Pressure and Flow)**

Alarm limits will be reviewed during October of each year. Gas Control will provide the responsible Field M&C and GT&D Personnel with the current alarm limits. Gas Control will request that the responsible Field M&C and GT&D Personnel review their transmission pressure and flow limits. Once reviewed, they will either concur with the current settings or request new alarm settings. Gas Control will review the requested changes to the transmission Hi-Hi and Lo-Lo pressure and flow limits and make changes to the limits as required.

### Design Criteria

**Hi-Hi and Lo-Lo Alarm Limits (Pressure and Flow)**

Alarm limits will be reviewed during October of each year. Gas Control will provide the responsible Transmission System Planning Engineers with the current alarm limits. Gas Control will request that the responsible Transmission System Planning Engineers review their transmission pressure and flow limits. Once reviewed, they will either concur with the current settings or request new alarm settings. Gas Control will review the requested changes to the transmission Hi-Hi and Lo-Lo pressure and flow limits and make changes to the limits as required.

### Distribution System

**Hi-Hi, Lo and Lo-Lo Alarm Limits (Pressure and Flow)**

Alarm limits will be reviewed during October of each year. Gas Control will provide the responsible Field M&C and GT&D Personnel with the current alarm limits. The responsible Field M&C and GT&D Personnel will review the limits and concur or request to change the limits. Gas Control will implement the requests in mid-November of each year. Again, all Hi-Hi, [No Hi alarms are set], Lo and Lo-Lo alarms are established by the Principal Engineer of Gas Measurement/Gas Quality Engineering, or designee, and may not be changed at operator discretion.

### Gas Quality

Alarm limits will be reviewed during October of each year. Gas Control will provide the Gas Quality Response Team Lead with the current alarm limits. Gas Control will request that the Gas Quality Response Team Lead review their Gas Quality alarm limits. Once reviewed, they will either concur with the current settings or request new alarm settings. Gas Control will review the requested changes to the Gas Quality Hi-Hi and Lo-Lo alarm limits and make changes to the limits as required.

## *Alarm Response*

### Alarm Response, Transmission

**(Pressure, Flow and Gas Quality)**

All alarms will be acknowledged. In the case of Hi-Hi and Lo-Lo alarms the acknowledgment of the alarm and notification procedure below will be followed. In the case of Hi and Lo alarms the operator will analyze the system in alarm and determine if the alarm can be explained by system or loading conditions. Notification of responsible Field M&C Personnel is not necessary if the operator's analysis of the alarm indicates that the alarm is due to normal system conditions. If the operator's analysis of the alarm suggests equipment failure or facility problems, the operator will follow the same actions as outlined below for Hi-Hi and Lo-Lo alarms (See **Appendix I**, *Operating Policy for Frequent SCADA Alarms Related to Equipment Problems*).

**Required Actions – During the first 10-minute period after alarm acknowledgment**
Transmission Coordinators (TCs), and Gas System Operators (GSOs) will acknowledge, analyze and respond to all alarms.

- Brentwood Gas Control will establish communications with System Gas Control regarding the active alarm.
- Brentwood Gas Control and System Gas Control will analyze the upstream and downstream points to help determine the system condition and the cause of the active alarm.
- Upon completion of the analysis, a corrective action will be taken which may include a remote operation, contacting the responsible Field M&C Personnel, and continued monitoring.

**Required Actions- During the second 10-minute period.**

- The TC and the GSO will communicate and coordinate the next steps.
- Communicate next steps with responsible Field M&C Personnel and/or GT&D Gas Engineering Personnel.

If the TC, GSO, and the responsible Field M&C Personnel and/or GT&D Gas Engineering Personnel cannot agree on a course of action, the TC or GSO will contact their operations on-call representative. The Gas System Operations on-call supervisor will discuss and agree on a course of action that will be communicated to the TC or GSO on shift.

**Further Actions Required.**

- Abnormal Incident Report if required by the Senior TC.

## Alarm Response, Distribution

**(Pressure and Flow)**

**High Pressure Distribution (60 psig and below)**

All alarms will be acknowledged. In the case of Hi-Hi and Lo-Lo alarms the acknowledgment of the alarm and notification procedure below will be followed. In the case of Lo alarms the operator will analyze the system in alarm and determine if the alarm can be explained by system or loading conditions. Notification of responsible Field M&C Personnel is not necessary if the operator's analysis of the alarm indicates that the alarm is due to normal system conditions. If the operator's analysis of the alarm suggests equipment failure or facility problems, the operator will follow the same actions as outlined below for Hi-Hi and Lo-Lo alarms.

**Low Pressure Distribution (Inches of Water Column)**

All Low Pressure distribution system alarms will require notification to the responsible Field M&C Personnel. A second notification must be made if a Lo pressure alarm continues to move toward a Lo-Lo alarm state.

**Required Action – During the first 10-minute period after alarm acknowledgment**

Transmission Coordinators (TCs), and Gas System Operators (GSOs) will acknowledge, analyze and respond to all alarms.

- Brentwood Gas Control will establish communications with System Gas Control regarding the active alarm.
- Brentwood Gas Control and System Gas Control will analyze the upstream and downstream points to help determine the system condition and the cause of the active alarm.
- Upon completion of the analysis, the responsible Field M&C Personnel will be notified, and monitoring will resume.

**Required Action- During the second 10-minute period.**

- Continue to monitor the system in alarm.

If the TC, GSO, and the responsible operating personnel cannot agree on a course of action, the TC or GSO will contact their operations on-call representative. The Gas System

Operations on-call supervisor will discuss and agree on a course of action which will be communicated to the TC or GSO on shift.

## ***Definitions***

Low Pressure Distribution Systems are gas systems measured in inches of water column. Unless otherwise noted, the Hi-Hi is set at 12" and the Lo-Lo is set at 4".

High Pressure Distribution Systems are gas mains operating at a pressure of 60 psig or less.

Transmission systems are gas pipelines operating at a pressure greater than 60 psig.

SCADA is an acronym for *Supervisory Control and Data Acquisition* and is a means of remotely monitoring and controlling PG&E's gas transmission and distribution systems. The term SCADA will be used to refer to both the ADACS and Citect systems. SCADA alarms identify data from field devices which are unusually high, low or when devices report a failed condition. Flashing messages, flashing buttons and/or a beeping sound notify the personnel monitoring the SCADA screens. Alarms can be set for analog points having a continuous range of values such as pressures and flows.

Gas Control currently consists of 2 gas system-monitoring facilities. System Gas Control is located in San Francisco and its remote operations center is located in Brentwood.

Field M&C Personnel include the GT M&C Supervisors (Districts) and/or the Area M&C T&R Personnel (Divisions).

GT&D Operations Personnel includes personnel directly associated with gas operations, such as Gas Control (System Gas Control and Brentwood Gas Control) and Station Operations (Topock Compressor Station, Hinkley Compressor Station, Los Medanos Storage Field and McDonald Island Storage Field).

GT&D Gas Engineering Personnel includes groups who lend direct support to gas operations. They include Gas Quality Response Team members, Transmission System Planning Engineers, Principal Engineer of Gas Measurement/Gas Quality Engineering, or designee, and the Sr. Gas Engineers.

GT&D Personnel includes everyone within GT&D Operations Personnel and GT&D Gas Engineering Personnel.

Design Day A statistical planning criteria used to ensure reliable gas service under unusually cold winter temperatures. Cold Winter Day (CWD) planning criteria includes serving all core and non-core customer loads with core customers using 70% of their

projected Abnormal Peak Day demand. Abnormal Peak Day (APD) planning criteria includes serving all core customers with all non-core customers fully curtailed.

Design Criteria (DC) established by TSP to identify alarm changes necessary during cold weather events.

*Gary Chrisco* *4/28/08*

Gary Chrisco Date 4/28/08
Manager, Gas Control

## Appendix A - Gas SCADA System Digital Alarm Policy & Procedures

Gas SCADA system digital points are those points that communicate a system or equipment status (on-off, open-closed, normal-failed, etc). A digital point in the alarm state may be an indicator of a serious abnormal system condition or it may be a piece of information about the system that requires no response.

The Policy and Procedures outlined below were developed to ensure the safe operation and to maintain the integrity of PG&E's natural gas system by categorizing and documenting the response to gas SCADA digital alarms.

### Policy

The response to each active digital alarm will be defined by the responsible maintenance supervisor.

System Gas Control will maintain a database of each digital alarm and it's associated response.

Additions, deletions, or changes to the digital alarms or alarm responses will follow the same procedure established for analog SCADA alarms.

As alarms occur, the gas control center will acknowledge and analyze each alarm and follow the response outlined by the responsible maintenance group.

### Procedures

Digital alarms will be divided into the following categories:

1. Power
2. Data communications
3. Fire
4. Security
5. Digital operating alarms, no maintenance response required

The responsible maintenance supervisor (GSM District Superintendent or OM&C Gas Operating Supervisor) will define the response to each digital alarm in his/her area of responsibility.

## Alarm Response and Required Action

Alarm response will defined as:

- **I=Immediate notification**
- **ND=Next day notification**
- **NWD=Next working day notification**
- **IR=Immediate response**

*Immediate notification* and *immediate response* alarms require that the responsible maintenance group be notified immediately. Immediate notification alarms are those that the maintenance group has deems significant enough to warrant their attention at any time of the day or night. Depending on the nature of the alarm, the maintenance supervisor may elect not to call out personnel immediately. If an alarm is categorized as *immediate response*, it is of a serious enough nature to require a response to the site by maintenance personnel.

*Next day* alarms require that the responsible maintenance supervisor be contacted during daylight hours at the next opportunity, but no later than the day following the day in which the alarm was initially received.

*Next working day* alarms require that the responsible maintenance supervisor be contacted on the next working day (normally Monday) either by phone, voice mail, e-mail, or maintenance memo.

The Senior Transmission Coordinator may request an immediate response if it is deemed necessary, and may choose to escalate the decision to the OP&C on-call supervisor if the responsible maintenance supervisor is not in agreement.

## Alarm Review

During October, of each year, the digital alarm responses will be reviewed by each responsible maintenance supervisor. Upon completion of the review, Operations Planning and Control will implement the requested revisions and update the digital alarm response database spreadsheet.

## Appendix B - SCADA Alarm Settings

| PVID | Alarm Setting | | | |
|---|---|---|---|---|
| | Hi-Hi | Hi | Lo | Lo-Lo |
| Transmission (above 60 psig) | not set above MOP plus 3 psi[r] | set at or below the MOP at the discretion of the TC/Gas System Operator (GSO) | set at the discretion of the TC/GSO except during winter design criteria period[s] | not set below MRP less 3 psi[t] |
| HP Distribution (60 psig and below) | *set at the MAOP*** | N/A | *set at the MRP*** | *not set below MRP less 2 psi*** |
| LP Distribution (inches of water column) | *set at 12" w.c.*** | *set at 10.5" w.c.*** | *set at 5" w.c.*** | *set at 4" w.c.*** |
| Transmission Flow | set for selected points only[q] | set at the discretion of the TC/GSO | set at the discretion of the TC/GSO | set for selected points only, ie for lines which do not normally shut-in and selected single feeds[s] |
| Distribution Flow | set at the responsible O&M group's request[u] | set at the discretion of the TC/GSO | set at the discretion of the TC/GSO | set at the responsible O&M group's request[r] |
| Gas Quality | set as recommended by the gas quality emergency response team*** | set at the discretion of the TC/GSO | set at the discretion of the TC/GSO | set as recommended by the gas quality emergency response team*** |

[r]alarm settings can be changed only with the concurrence from Ops Sprvsr, Sr TC, Trans Sprvsr, or the Mgr of Gas Control.
***must be approved by the Principal Engineer of Gas Measurement/Gas Quality Engineering, or the designee*
***alarm settings can be changed only with the concurrence of gas quality emergency response team

This table lists the parameters used to establish various pressure, flow, & gas quality alarm setpoints in the gas SCADA system, the authority for initial establishment of alarm settings, and the approval required for making changes to those settings. Changes should be made following the GSO SCADA Alarm Change Procedure (Appendix B)

# Appendix C - GSO SCADA Alarm Change Procedure

**To make an alarm database change, in both Citect & ADACS, the person initiating the change is responsible for the steps listed below. Any Senior Transmission Coordinator or Transmission Coordinator can initiate a change.**

| Step | Purpose |
|---|---|
| 1. **Only the following in Gas Control can approve an alarm change: Senior TC, Manager of Gas Control, SGC Transmission Supervisor, and the Brentwood Operations Supervisor. Also, any alarm changes to the Distribution System (60# and under), must be approved by the Principal Engineer of Gas Measurement/Gas Quality Engineering, or the designee.** | *This ensures that GSO supervision has reviewed & authorized the alarm change.* |
| 2. **SGC will notify the Brentwood Gas Control Center via the Gas Logging System to make an alarm change. The communication should include the PV/Tag name or ID, point description, desired settings & the name of the approver. *Remember, in ADACS, not every PVID in SGC is the same as in the field!*** | *Brentwood Gas Control Center receives instruction from SGC on which alarm points must be changed in ADACS and Citect.* |
| 3. **SGC will change their alarm settings on the SGC ADACS VAX and Citect. Brentwood will update their respective BNO/BSO ADACS VAXes and Citect. Please use the Policy, Procedures and Responsibilities Letter in the SCADA Alarm Policy Binder* as a guide when making changes.** | *This updates the actual SCADA alarm points in ADACS and Citect, per the agreed settings in step 1.* |
| 4. **SGC will update the Alarm Exceptions tab, located as a tab within the Master SCADA Alarm Database. This can be found in the E-Library or at the following path: *\\go301\sharefiles\OPC\OPC_HLP\eBinder\Binder 7 SCADA PIU, RTU, Telecom\SCADAAlarmUpdate.xls.* SGC will make any changes to the Alarm Exceptions tab, noting the date, initials of the person making and/or approving the change, and any pertinent comments. The Alarm Exceptions tab is to be used *with* the Master SCADA Alarm Database. Since the Master SCADA Alarm Database is updated by the SCADA Alarm Coordinator, and they may not be on shift, one should always check any outstanding exceptions which may not be reflected in the Master SCADA Alarm Database. The SCADA Alarm Coordinator is responsible for transferring ALL permanent alarm changes from the Exceptions tab to the Master SCADA Alarm Database.** | *This maintains a record of all changes. The Alarm Exceptions tab is an online reference to all SCADA alarm settings which have not been implemented into the Master SCADA Alarm Database. The SCADA Alarm Coordinator is the only person that updates the Master SCADA Alarm Database. Members of SGC will update the Alarm Exceptions Sheet, located as a tab in the Master SCADA Alarm Database, when the SCADA Alarm Coordinator is not on shift. When the SCADA Alarm Coordinator returns on shift, they are responsible for updating the Master SCADA Alarm Database with any permanent changes.* |
| 5. **The Alarm Exceptions tab is also used for managing any *temporary alarms* which will *not* be placed into the Master SCADA Alarm Database. These include changes associated with clearance work, Design Criteria settings, and emergency conditions. All changes documented should include the date, time, initials of the person making and/or approving the change, and any pertinent comments.** | *Provides information on temporary alarms included within the Alarm Exceptions tab. TCs will add temporary alarm changes to the Alarm Exceptions tab, both when they are in effect, and then when they are returned to normal. The SCADA Alarm Coordinator is responsible for clearing these temporary alarm changes, removing them from the Alarm Exceptions tab, once their state has returned to normal.* |
| 6. **SGC will cut and paste the GLS entry, pertaining to the alarm change, into the body of an e-mail, and send it to the Gas Control Manager, the Transmission Supervisor, GT&D GSO All Transmission Coordinators, the Brentwood Operation supervisor, GSO BOPS1, and any other responsible personnel (i.e. Field M&C Personnel, GE Personnel Support**.)** | *Provides an electronic communication to all pertinent parties about any alarm changes.* |
| 7. **SGC is required to print the e-mail message sent and file it under the Alarm Exceptions tab, located within the SCADA Alarm Information Binder.** | *Maintains a hard copy of all communications associated with alarm changes.* |

* The SCADA Alarm Policy located in Binder 7 contains the official GSO alarm policy. As you can see, each step in the procedure has a purpose. Please follow the procedure carefully. The Master SCADA PIU Alarm Database is updated on a regular basis.

** See Page 7 of the Gas SCADA - System Alarm Limits - Policy and Procedures Document (Alarm-Policy20.doc) for Terms and Definitions.

## APPENDIX D - Gas SCADA Policy and Implementation of Alarm Limit Settings for new Gas SCADA Points

◊ **When new points are added to any Gas SCADA node, the operations supervisor for that node will be specifically provided with a list of the points added to the computer as well as the as-implemented alarm settings for each point.**

◊ **Generally new points to Gas SCADA will not have any HI-HI, HI, LO, or LO-LO alarm limit settings. The GSO Operations Supervisor responsible for monitoring that data point(s) will be notified about the new point(s) so that he/she can establish or confirm the correctness of the alarm settings.**

Sample notification message:

Bob:

The following new points have been implemented on SAC:

| PVID | Description |
|---|---|
| 400 | XXX-STA L999 U/S PRESS |
| 401 | XXX-STA L999 D/S PRESS |

Note that no alarm limits have been set for the new points.

Note: MOP and alarm settings in grey boxes apply to flow from North to South

# Appendix E - OPERATING PARAMETERS AND HI-HI ALARM SETTINGS

## L300A

| Location | Elevation (feet) | Elevation difference (feet) | Pressure change due to elevation difference (psi) | MAOP (psig) | MOP due to elev difference (psig) | HI-HI Alarm Setting MOP+ 3psi (psig) |
|---|---|---|---|---|---|---|
| Topock | 593 | | | | 865 | 868 |
| | | 87 | 1.8 | | | |
| Low Spot | 506 | | | 867 | | |
| | | 2045 | 41.2 | | | |
| PLS-1 | 2551 | | | | 825 | 828 |
| PLS-1 | 2551 | | | | 779 | 782 |
| | | 1840 | 34.9 | | | |
| Low Spot | 711 | | | 815 | | |
| | | 1426 | 27.1 | | | |
| PLS-2 | 2137 | | | | 787 | 790 |
| PLS-2 | 2137 | | | | 682 | 685 |
| | | 370 | 5.9 | | | |
| Low Spot | 1767 | | | 688 | | |
| | | 518 | 8.3 | | | |
| PLS-2AX | 2285 | | | | 679 | 682 |
| PLS-2AX | 2285 | | | | 572 | 576 |
| | | 75 | 1.0 | | | |
| Low Spot A | 2210 | | | 573 | | |
| | | 0 | 0.0 | | | |
| Hinkley | 2210 | | | | 573 | 576 |
| Hinkley | 2210 | | | | 860 | 863 |
| | | 24 | 0.5 | | | |
| Low Spot | 2186 | | | 861 | | |
| | | 186 | 3.8 | | | |
| PLS-3 | 2372 | | | | 857 | 860 |
| PLS-3 | 2372 | | | | 766 | 769 |
| | | 1932 | 35.9 | | | |
| Low Spot | 440 | | | 803 | | |
| | | 0 | 0.0 | | | |
| PLS-4 | 440 | | | | 803 | 806 |

## L300B

| Location | Elevation (feet) | Elevation difference (feet) | Pressure change due to elevation difference (psi) | MAOP (psig) | MOP due to elev difference (psig) | HI-HI Alarm Setting MOP+ 3psi (psig) |
|---|---|---|---|---|---|---|
| Topock | 593 | | | | 865 | 868 |
| | | 87 | 1.8 | | | |
| Low Spot | 506 | | | 867 | | |
| | | 2045 | 41.2 | | | |
| PLS-1 | 2551 | | | | 825 | 828 |
| PLS-1 | 2551 | | | | 779 | 782 |
| | | 1840 | 34.9 | | | |
| Low Spot | 711 | | | 815 | | |
| | | 1426 | 27.1 | | | |
| PLS-2 | 2137 | | | | 787 | 790 |
| PLS-2 | 2137 | | | | 682 | 685 |
| | | 370 | 5.9 | | | |
| Low Spot | 1767 | | | 688 | | |
| | | 288 | 4.8 | | | |
| PLS-2BX | 2055 | | | | 683 | 686 |
| PLS-2BX | 2055 | | | | 673 | 676 |
| | | 0 | 0.0 | | | |
| Low Spot B | 2055 | | | 573 | | |
| | | 155 | 2.0 | | | |
| Hinkley | 2210 | | | | 570 | 573 |
| Hinkley | 2210 | | | | 860 | 863 |
| | | 24 | 0.5 | | | |
| Low Spot | 2186 | | | 861 | | |
| | | 186 | 3.8 | | | |
| PLS-3 | 2372 | | | | 857 | 860 |
| PLS-3 | 2372 | | | | 766 | 769 |
| | | 1932 | 35.9 | | | |
| Low Spot | 440 | | | 803 | | |
| | | 0 | 0.0 | | | |
| PLS-4 | 440 | | | | 803 | 806 |

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Note: MOP and alarm settings in grey boxes apply to flow from North to South

## Appendix E - OPERATING PARAMETERS AND HI-HI ALARM SETTINGS

### L300A

| Location | Elevation (feet) | Elevation difference (feet) | Pressure change due to elevation difference (psi) | MAOP (psig) | MOP due to elev difference (psig) | HI-HI Alarm Setting MOP+ 3psi (psig) |
|---|---|---|---|---|---|---|
| PLS-4 | 440 | | | | 754 | 757 |
| | | 152 | 2.7 | | | |
| Low Spot | 288 | | | 757 | | |
| | | 0 | 0.0 | | | |
| PLS-5 | 288 | | | | 757 | 760 |
| PLS-5 | 288 | | | | 668 | 671 |
| | | 70 | 1.0 | | | |
| Low Spot | 218 | | | 669 | | |
| | | 303 | 4.5 | | | |
| Kettleman | 521 | | | | 664 | 667 |
| Kettleman | 521 | | | | 839 | 842 |
| | | 51 | 1.0 | | | |
| Low Spot | 470 | | | 840 | | |
| | | 377 | 7.8 | | | |
| PLS-6A | 847 | | | | 832 | 835 |
| PLS-6A | 847 | | | | 620 | 623 |
| | | 717 | 10.2 | | | |
| Low Spot A | 130 | | | 631 | | |
| | | 52 | 0.7 | | | |
| PLS-7A | 182 | | | | 630 | 633 |
| PLS-6AX has been removed | | | | | | |
| PLS-7A | 182 | | | | 555 | 558 |
| | | 174 | 2.2 | | | |
| Low Spot | 8 | | | 558 | | |
| | | 0 | 0.0 | | | |
| Milpitas | 8 | | | | 558 | 561 |

### L300B

| Location | Elevation (feet) | Elevation difference (feet) | Pressure change due to elevation difference (psi) | MAOP (psig) | MOP due to elev difference (psig) | HI-HI Alarm Setting MOP+ 3psi (psig) |
|---|---|---|---|---|---|---|
| PLS-4 | 440 | | | | 754 | 757 |
| | | 152 | 2.7 | | | |
| Low Spot | 288 | | | 757 | | |
| | | 0 | 0.0 | | | |
| PLS-5 | 288 | | | | 757 | 760 |
| PLS-5 | 288 | | | | 668 | 671 |
| | | 70 | 1.0 | | | |
| Low Spot | 218 | | | 669 | | |
| | | 303 | 4.5 | | | |
| Kettleman | 521 | | | | 664 | 667 |
| Kettleman | 521 | | | | 839 | 842 |
| | | 51 | 1.0 | | | |
| Low Spot | 470 | | | 840 | | |
| | | 392 | 7.9 | | | |
| PLS-6B | 862 | | | | 832 | 835 |
| PLS-6B | 862 | | | | 620 | 623 |
| | | 666 | 9.5 | | | |
| Low Spot B | 196 | | | 631 | | |
| | | 0 | 0.0 | | | |
| PLS-6BX | 196 | | | | 631 | 634 |
| PLS-6BX | 196 | | | | 631 | 634 |
| | | 17 | 0.2 | | | |
| Low Spot B | 179 | | | 631 | | |
| | | 0 | 0.0 | | | |
| PLS-7B | 179 | | | | 631 | 634 |
| PLS-7B | 179 | | | | 597 | 600 |
| | | 171 | 2.4 | | | |
| Low Spot | 8 | | | 600 | | |
| | | 0 | 0.0 | | | |
| Milpitas | 8 | | | | 600 | 603 |

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## Appendix F – Design Criteria Alarm Policy

The Design Criteria Temperature Forecast is located at each workstation in System Gas Control. This program provides warnings when local temperature forecasts are expected to create local customer demands on pipelines which reach, or exceed, Design Criteria levels.

This program references a temperature forecast and should be checked a minimum of two times a day, once at 0730 and again at 1030 hrs. Please place a copy of each of these in our Design Criteria folder, located behind the TC-1 desk.

TSP provides the alarm settings and suggested Design Criteria regulation data, which is displayed on specific SCADA screens. Lo alarms will be set at TSP determined values, not at operator discretion, during the period the design criteria is enacted.

Design Day Process:

1) Open the Temperature Forecast by opening the Design Criteria folder and clicking on the Design Criteria Temperature Forecast icon.
2) Review column two (Next Day Design) and column three (7 Day Design Criteria).
3) The "COLD" alarm appears when an area is 70% of APD or greater. The "CWD" and "APD" alarms are triggered when a location is 75% of APD and 100% of APD, respectively. When any of these three alarms appear, under the Next Day Design Criteria alarm column, follow the instructions in the Design Day Action Plan.
4) Design Criteria alarms will remain in effect until the 7 Day Design Criteria column (Column three) is no longer flagged "COLD, CWD, or APD".
5) Design Day Action Plan can be triggered by either the Design Criteria Temperature Forecast or TSP defined Hi-Hi flow alarms (90% of CWD).

Design Day Action Plan:

a) Go to the ADACS screen "ALMMEN" which displays links to various geographic areas where Normal and Design Criteria alarm settings and recommended pressure control set points can be found. On Citect, select the Alarms tab, and then the Alarm Settings drop down menu. Each of the geographic areas are listed here.

b) Find the location(s) that matches the alarm (COLD, CWD, APD). All of the data points that are listed in the impacted area will need to be set at Design Criteria settings. Utilizing the Gas Logging System, the Brentwood Gas Control Center will be advised of the changes that are necessary for each location. SGC will also advise the Brentwood Gas Control Center on the

GLS to notify all responsible supervision, including the TSP Area Engineer(s) (located on the SCADA Design Criteria Alarm screens).

c) Once all required alarm changes are completed, System Gas Control will print out the effected Design Criteria SCADA screen(s), which will include the time and date of the change(s).
d) System Gas Control will update any Design Criteria alarm changes within the Alarm Exceptions tab, located in the online SCADA Alarm Database and also file a hard copy of the Design Criteria screenshots in the Alarm Exception Log (Binder 7), to maintain a paper trail.
e) Once Design Criteria areas have returned to normal, SGC will restore alarms to their normal settings and advise the Brentwood Gas Control Center to do the same, via the GLS. ***Keep in mind that ONLY the 0730 forecast may be used to determine whether the alarm settings can be changed back to normal.*** They will also advise Brentwood Gas Control Center to notify all responsible supervision, including the TSP Area Engineer(s), of this event.
f) Remove all alarm changes from the Alarm Exception tab, located in the online SCADA Alarm Database.

Alarm Response:

Key LO alarms will be established during Design Day events. The response to a Design Day LO alarm is identical to the response for a LO-LO alarm as outlined in the Alarm Policy. LO-LO alarms are set based on the minimum required pressure (MRP) of the piping immediately downstream of the SCADA site. If a LO-LO alarm is breached, service to the customers connected to the piping immediately downstream of the SCADA site may be in jeopardy. Design Day LO alarms are set based on the MRP of the entire piping network downstream of a SCADA site. If a Design Day LO alarm is breached, service to customers at the end of the system served by that SCADA site may be in jeopardy.

## Appendix G – Temporary Exceptions to Alarm Setpoint Criteria

The following are temporary exceptions to the alarm setpoint criteria outlined in the Gas SCADA System Alarm Limits Policy and Procedures:

| Site | *PVID* | Exception | Temporary Alarm Settings | | | |
|---|---|---|---|---|---|---|
| | | | Hi-Hi | Hi | Lo | Lo-Lo |
| *Taraval and Wawona*<br><br>*San Francisco* | *12018* | *Temporary alarm settings to allow system to meet minimum delivery pressures during maximum load periods. Authorized by Gas Distribution Engineering and Planning Manager* | *12.0 inches water column* | *11.2 inches water column* | *5.0 inches water column* | *4.0 inches water column* |
| *Presidio and Geary*<br><br>*San Francisco* | *12022* | *Temporary alarm settings to allow system to meet minimum delivery pressures during maximum load periods. Authorized by Gas Distribution Engineering and Planning Manager* | *12.0 inches water column* | *11.2 inches water column* | *5.0 inches water column* | *4.0 inches water column* |

## Appendix H –Alarm Setpoints During Clearance Work

Alarm setpoints defined for the purpose of monitoring outside of normal HI-HI/LO-LO alarm setpoints during clearance work: (pressure, flow and gas quality)

- Will be identified in the clearance process by the clearance supervisor and GSO Clearance Coordinator.

1. Temporary setpoints will be identified in the clearance document.
2. Temporary setpoints will be confirmed in the clearance review process by the GSO Clearance Coordinator.
3. Temporary setpoints will be noted in the clearance cover letter instructions by the GSO Clearance Coordinator.
4. If there is no SCADA available at the job location, there will be an attempt if feasible to use another SCADA site to provide monitoring capability in addition to the gauge locations.
5. **ALARM SETPOINTS WILL NOT BE LEFT IN HI-HI OR LO-LO STATUS DURING A JOB. TEMPORARY SETPOINTS WILL BE DEFINED AND IMPLEMENTED FOR MONITORING.**
6. Hi-Hi alarms will not be set above the lower of Maximum Allowable Operating Pressure (MAOP) plus 3 pounds per square inch (psi) or Maximum Operating Pressure (MOP) plus 3 pounds per square inch (psi).

## Appendix I – Operating Policy for Frequent SCADA Alarms Related to Equipment Problems

Repetitive alarms related to SCADA and/or Telecom equipment failures can be distracting, carrying the potential of masking valid pipeline alarms throughout the system. This policy addresses the procedure to be followed for problematic data points that have been analyzed and determined to be Telecom or SCADA equipment problems, as opposed to gas pressure, flow or quality problems.

### Contact Procedures

1. If the GSO receives a data outage/problem at a facility that is determined critical by the Senior Transmission Coordinator, contact the responsible supervisor to facilitate repairs immediately. If the problem cannot be repaired immediately, the Senior TC will require the responsible supervisor to station personnel at the facility until all of the necessary repairs are made. If the station or facility is determined non-critical, the request for repairs may be submitted for regular work hours or at the discretion of the responsible supervisor.

2. When a GSO receives a data outage/problem at a particular RTU, they will refer to the RTU Response Binder to determine whether the response is ***Immediate***, ***Next Day***, or ***Next Working Day***. If the response is ***Immediate***, the GSO will respond within 15 minutes of the data failure. During the first 15 minutes, the GSO should perform troubleshooting of the site, by resetting the RTU, checking for power failures, and searching for communication failures (i.e. mountain tops). After 15 minutes, a call must be made to the responsible supervisor to initiate the restoration process by contacting maintenance personnel.

3. If an RTU is designated as ***Next Day***, the responsible personnel will make a call out after 08:00 hours. If an RTU is designated as ***Next Working Day***, the responsible personnel will be notified after the start of the next actual workday.

### Failed Alarm Management

1. If an RTU (PIU) fails intermittently, the RTU may be placed in *alarm inhibit* by the GSO. The RTU will continue to be polled for the latest information, but will not alert the operator with an audible PIU failure alarm. The alarm shows on the operator summary as ALARMRESERV until the RTU is placed back to normal. The GSO will notify System Gas Control that data from the RTU may be suspect.

Should the RTU fail completely, follow the RTU outage policy in the Gas Control Centers. This decision will require communication with, and concurrence of System Gas Control.

2. A single data point that is frequently alarming (e.g. a single bad pressure transducer at a station) can be placed in *off alarm check*. The point **must** be placed in *off alarm check* while it is in the alarm state. This will retain the alarm condition in the operator summary.

3. Send an electronic work request for problems requiring action by field personnel. Utilize the **GSM Work Request** or send a Division Work Request via e-mail if required. The GSO will prioritize the request appropriately, as per the RTU Response Binder.

4. Data points that are used in calculations by SCADA (e.g. for pipeline inventory calculations) may be placed off scan and estimated values inserted. Data points may be taken off scan only with the approval of the Senior TC, Operations Supervisor, Transmission supervisor, or Manager.

5. The *alarm inhibit*, *off alarm check* and *off scan* will be returned to normal when repaired. A point placed in *alarm inhibit*, *off alarm check* or *off scan* will be logged in the shift summary and remain until the repair has been completed.

# Establishing Setpoints on Overpressure Protection Devices

**Summary**

This work procedure covers requirements for determining the setpoints of overpressure protection (OPP) devices protecting PG&E's gas transmission and distribution (GT&D) pipelines that operate in excess of 60 pounds per square inch gauge (psig).

Typical OPP devices include monitor valves, relief valves, and automatic shutoff valves.

This procedure does not apply to overpressure protection of auxiliary systems (for example, lube oil, air, and hydraulic systems, natural gas-operated control systems, etc.), or to gas field collection relief valves that act as the primary automatic pressure control into a gathering/transmission line, or to district regulator stations.

Level of Use: Information Use

**Target Audience**

Station and pipeline engineers and maintenance and operations employees.

**Safety**

Perform all gas system engineering, design, operations and maintenance safely and in accordance with all applicable safety rules, Utility Standard Practice (USP) 22, "Safety and Health Program," and the *Code of Safe Practices*.

**Before You Start**

Employees must know the gas systems involved in the setpoint revisions, the gas system operations, and the federal codes governing maximum allowable operating pressures (MAOP) and overpressure protection (OPP) requirements.

**Employee qualifications:** Employees performing inspections or maintenance in accordance with this procedure must first receive proper training and qualification under the applicable operator qualification (OQ) tasks:

- 14-02.00 "Inspect/Test Pressure Regulation and Limiting Devices."
- 16-01.00 "Test/Maintain Relief Devices."

**Tools, materials, and equipment:** Use only Company-approved tools and equipment. "Equipment" includes, but is not limited to, calibrated test gauges, calibrated pressure recorders, air monitoring instruments, and leak test soap solution. Refer to manufacturer's instructions for specialized tools required for the maintenance of unique equipment.

Table of Contents for Procedure Steps



**Procedure Steps**

## 1 General Requirements

1.1 The OPP device prevents the pipeline from being over-pressured if the regulator(s) or compressor(s) supplying the pipeline fails. In addition to properly designing, sizing, and maintaining the OPP device, correctly establishing the device setpoint is crucial to ensuring that the OPP device operates properly and provides the necessary protection to the pipeline.

1.2 The OPP setpoint evaluation must account for the potential pressure buildup beyond the setpoint, which could exceed the code-allowable overpressure. An OPP device does not prevent pressure from increasing above its setpoint under all conditions. This is especially true for conventional relief valves, since their wide-open relief capacity may not trigger until the pressure increases to 110% of setpoint.

1.3 If the OPP setpoint is adjusted too closely to the supply device setpoint, the OPP could interfere with the operation of the pressure regulator or compressor. Therefore, all of the following below in this procedure must be considered:

## 2 Upper Setpoint Limitation

2.1 Based on Code of Federal Regulations (CFR) Title 49, § 192.201(a), the overpressure protection device must be set to ensure the pressure in a transmission or distribution feeder main (DFM) system does not exceed the lower of the following pressure settings:

1. The maximum allowable operating pressure plus 10%.

2. The pressure that produces a hoop stress of 75% of specified minimum yield stress (SMYS).

2.2 For this document, the lower of the pressures listed above must be considered the maximum overpressure (MOvP).

2.3 For the GT&D transmission system, determine the setpoint of the OPP device based on the line's maximum operating pressure (MOP), not the maximum allowable operating pressure (MAOP). Generally, whenever the line's MOP is less than its MAOP, another transmission line with a lower MAOP is tied directly to it. This requires the first line's MOP to be lower. The OPP device must be set to protect the transmission line with the lower MAOP.

## 3 Hydraulic Head Effect

3.1 If there is a substantial drop in pipeline elevation downstream of the regulator station, the low point of the pipeline sees an increase in pressure due to the hydraulic head pressure effect. The low point of the pipeline requires the setpoints of both the supply and OPP devices to be reduced corresponding to the pressure increase due to the elevation change.

3.2 The pressure increase at the low point of the pipeline occurs due to the hydraulic head effect (weight) of the natural gas. However, hydraulic head effects are not considered relevant unless the elevation of the low point of the pipeline (downstream of the regulator station) is 400 feet or more below the regulating station. In these situations, contact the responsible GT&D station or pipeline engineer to calculate this effect. TD-4125P-07, Attachment 1, "Computing Pressure Increase Due to Hydraulic Head Effect," provides an equation for computing the pressure increase due to the hydraulic head effect.

## 4 Lower Setpoint Limitation

4.1 Set the relief valve or monitor valve controls just sufficiently above the MOP of the system being protected to permit the system to operate at the MOP without causing the relief valve to weep (vent gas), or the monitor valve to interact negatively with the regulator. Determine this pressure setpoint by considering the operating characteristics and operating tolerances of the valve being used. It must not be any higher than necessary, and must never be set to exceed the MOvP.

4.2 In some cases, it may be necessary to reduce the setpoint of the main supply device to below the pipeline MOP to prevent the supply device(s) and overpressure protection device(s) from interacting negatively with each other.

4.3 Another option is to replace the OPP device with another more responsive device (for example, replace the conventional relief with either a quick-opening relief valve or a monitor valve).

## 5 Types of OPP Devices and Their Operating Characteristics

5.1 **Monitor Valves** are essentially backup pressure regulators set to operate above the pipeline MOP. These monitor valves operate if the primary supply device fails to maintain pressure below its setpoint. The monitor valves may be controller or pilot-operated. Although monitor valves are designed to control pressure, several factors (controller responsiveness, monitor versus regulator actuator speed, etc.) can contribute to an outlet pressure initially exceeding the monitor valve setpoint.

5.2 **Pressure Relief Valves** for transmission lines fall into three categories:

- Conventional (direct spring or conventional pilot-operated).
- Quick-opening, pilot-operated.
- Controller-operated.

1. Conventional relief valves require up to 10% over the setpoint to obtain full open flow capacity. This factor may require the setpoints of some valves to be set at 10% below the MOvP. These valves also characteristically weep small amounts of gas when the pressure approaches the setpoint.

2. Quick-opening relief valves (for example, Anderson-Greenwood type valves with pilots) achieve full open flow very near their setpoint. This type of relief valve also can operate near its setpoint without valve leakage.

3. The controller-operated relief valve may require several pounds per square inch (psi) over its setpoint to obtain full open capacity. These relief valves generally use a pneumatic-powered plug valve with a pneumatic controller.

## 6 Variables Affecting the Operating Characteristics of OPP Device

Several factors may affect the responsiveness of the OPP device to minimize any pressure increase above the OPP setpoint. These factors include:

- Proper tuning and calibration of the controller.
- Pilot and/or OPP device.
- Speed of operation of the regulator.

6 (continued)

- Internal volume of downstream piping.
- Design of the OPP system.
- Maintenance of the device.

## 7 Guideline for OPP Device Setpoints

7.1 Due to the difficulty in computing the maximum setpoint of OPP devices that ensure downstream pressure never exceeds limitations allowed in the code, Table 1, "Guidelines for Maximum Setpoint of OPP Device," below establishes the following guidelines based on minimal interference experienced in present and past applications:

**Table 1. Guidelines for Maximum Setpoint of OPP Device**

| MOP | < 250 psig | ≥ 250 psig |
|---|---|---|
| Monitor: | 5 psig over MOP | 10 psig over MOP |
| Relief (conventional): | 5 psig over MOP | 10 psig over MOP |
| Relief (with quick-opening pilots): | 5 psig under MOvP | 5 psig under MOvP |

7.2 Note that the setpoint of any OPP device must always be set lower than the MOvP. (In other words, never set the monitor or relief valve at MOP plus 10% or at a pressure that produces a hoop stress of 75% SMYS.)

7.3 If there is a substantial length of piping between the relief valve and the piping it is protecting, and that relief valve is not directly sensing the pipe it is protecting, subtract the anticipated pressure drop between the main piping and the relief valve from the setpoint recommended above in Table 1.

7.4 Following these guidelines ensures that the pressures under emergency conditions do not exceed the allowable values.

7.5 Due to operational problems, certain OPP installations may require the setpoint increased above these guidelines. Contact the appropriate facilities or pipeline engineer for agreement to increase the setpoint above these guidelines. The engineer alone computes the expected pressure increase to determine whether it complies with code.

7.6 Table 2 below provides examples of typical setpoints of overpressure devices for various operating pressures.

**Table 2. Examples of Overpressure Protection Device Setpoints**

| | | Monitor | Relief (Conventional) | Relief (Quick Opening) |
|---|---|---|---|---|
| **MOP** | **MOvP** | **MOP +5 or 10 psi** | **MOP + 5 or10 psi** | **MOvP - 5 psi** |
| 100 | 110 | 105 | 105 | 105 |
| 200 | 220 | 205 | 205 | 215 |
| 300 | 330 | 310 | 310 | 325 |
| 400 | 440 | 410 | 410 | 435 |
| 500 | 550 | 510 | 510 | 545 |
| 600 | 660 | 610 | 610 | 655 |
| 700 | 770 | 710 | 710 | 765 |
| 800 | 880 | 810 | 810 | 875 |
| 900 | 990 | 910 | 910 | 985 |
| 1000 | 1100 | 1010 | 1010 | 1095 |
| **NOTE:** Table 2 is based on limitation of MAOP plus 10%. 75% SMYS limitation and/or hydraulic head effect must be considered where applicable. 5 or 10 psig is based on Table 1 criteria. | | | | |

## 8 Records

8.1 Document maximum setpoints of OPP devices on PG&E Drawing No. 183018, "Overpressure Protection Device Maximum Settings." The latest revision of Drawing No. 183018 must remain on file in the Electronic Library System (ELS).

8.2 The manager of station engineering of GT&D approves the annual updates to PG&E Drawing No. 183018.

8.3 The manager of station engineering also issues or otherwise distributes PG&E Drawing No. 183018 annually on or before March 15th to reflect setpoint changes or additions submitted for posting.

**END of Instructions**

**Definitions**

**Maximum overpressure** (**MOvP):** The level of maximum permissible overpressure by code under any possible operating condition in the event of a failure of the pressure regulating device. This maximum overpressure is based on the limitations identified in section 2. For cases where hydraulic head is a factor, the maximum pressure pertains to the pressure at the station supplying the particular pipeline section.

**Over pressure protection (OPP):** A pressure-relieving or pressure-limiting apparatus installed to protect a pipeline from exceeding its maximum code-allowable overpressure, as described in CFR Title 49, Part 192, Subpart D, "Design of Pipeline Components," in the event of a pressure control failure.

Types of OPP devices include the following valves:

- Relief valves
- Monitor valves
- Security valves

**Implementation Responsibilities**

District or division maintenance or operating supervisors ensure the setpoints of the OPP devices in facilities located within their assigned areas do not exceed the maximum settings shown on PG&E Drawing No. 183018.

**Governing Document**

Utility Standard TD-4125S, "Maximum Allowable Operating Pressure Requirements for Gas Distribution Systems and Transmission and Gathering Lines."

**Compliance Requirement/ Regulatory Commitment**

This procedure enforces federal code CFR 49, § 192.195, "Protection against accidental overpressuring," which states that each pipeline connected to a gas source, so that the maximum allowable operating pressure could be exceeded as the result of pressure control failure or of some other type of failure, must have pressure relieving or pressure limiting devices that meet the requirements of § 192.199, "Requirements for design of pressure relief and limiting devices," and § 192.201, "Required capacity of pressure relieving and limiting stations."

**Reference Documents**

**Developmental References**:

CFR Title 49, § 192.195, "Protection against accidental overpressuring."

CFR Title 49, § 192.199, "Requirements for design of pressure relief and limiting devices."

CFR Title 49, § 192.201, "Required capacity of pressure relieving and limiting stations."

*Code of Safe Practices*

PG&E Drawing No. 183018, "Overpressure Protection Device Maximum Settings."

Utility Standard Practice (USP) 22, "Safety and Health Program."

**Supplemental References**:

Numbered Document H-70, "Pressure Relief Devices."

Utility Procedure TD-4430P-02, "Gas Transmission Stations Inspection, Testing, and Maintenance Procedures."

Utility Procedure TD-4125P-06, "Revising Setpoints on Overpressure Protection Devices."

Utility Standard TD-4125S, "Maximum Allowable Operating Pressure Requirements for Gas Distribution Systems and Transmission and Gathering Lines."

**Appendices**

NA

**Attachments**

TD-4125P-07, Attachment 1, "Computing Pressure Increase Due to Hydraulic Head Effect."

**Document Recision**

This procedure supersedes CGT Standard 4125.2, Revision 1.1, "Establishing Setpoints on Overpressure Protection Devices" dated October 1, 1999.

Establishing Setpoints on Overpressure Protection Devices

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**Revision Notes**

| Where? | What Changed? |
|---|---|
| NA | This is a document. |