

Summary of System Impacts Resulting from Shut In of Line 147

PG&E Gas Operations

10/13/2013

Peninsula Local Transmission System

Redacted

Line 147 Current Status

- Isolated from rest of Peninsula transmission system including Lines 101, 109, and 132.
- Line 147 is shut in and reduced to 125 psig on 10/7/2013.

With Line 147 Currently Shut In Significant Customer Outages Will Occur in San Carlos & Redwood City This Winter

- System at risk of outages at moderate 47 deg F temperature; about 19 occurrences per winter.
- Up to 1,800 customers will lose service at relatively moderate 44 deg F temperature; about 7 occurrences per winter. One noncore customer (hospital) fully curtailed.
- Up to 12,000 customers will lose service at 39 deg F temperature; 1 in 2 year occurrence. One noncore customer (hospital) fully curtailed.
- Up to 17,000 customers will lose service at 30 deg F temperature; 1 in 90 year occurrence, Abnormal Peak Day design standard. One noncore customer (hospital) fully curtailed.
 - Insufficient distribution capacity in San Carlos and Redwood City
 - Four critical supply sources in the middle of the San Carlos and Redwood City areas are lost due to isolation of Line 147.
- Peninsula local transmission system has adequate capacity to meet customer design standards however:
 - Significantly increased customer outage risks if we lose a portion of Line 101 between Line 132A and Line 147 due to an unforeseen event such as a 3rd party dig in.
 - Potential inability to perform Oct/Nov safety work (3 projects at risk)
 - Potential inability to perform 2014 safety work. Initial review of 2014 work shows 17 out of 65 proposed projects at risk due to Line 147 isolation. Significant safety projects at risk include Line 101 and Line 132 in-line inspections.

Estimated San Carlos and Redwood City Customer Impacts of Line 147 Shut-in

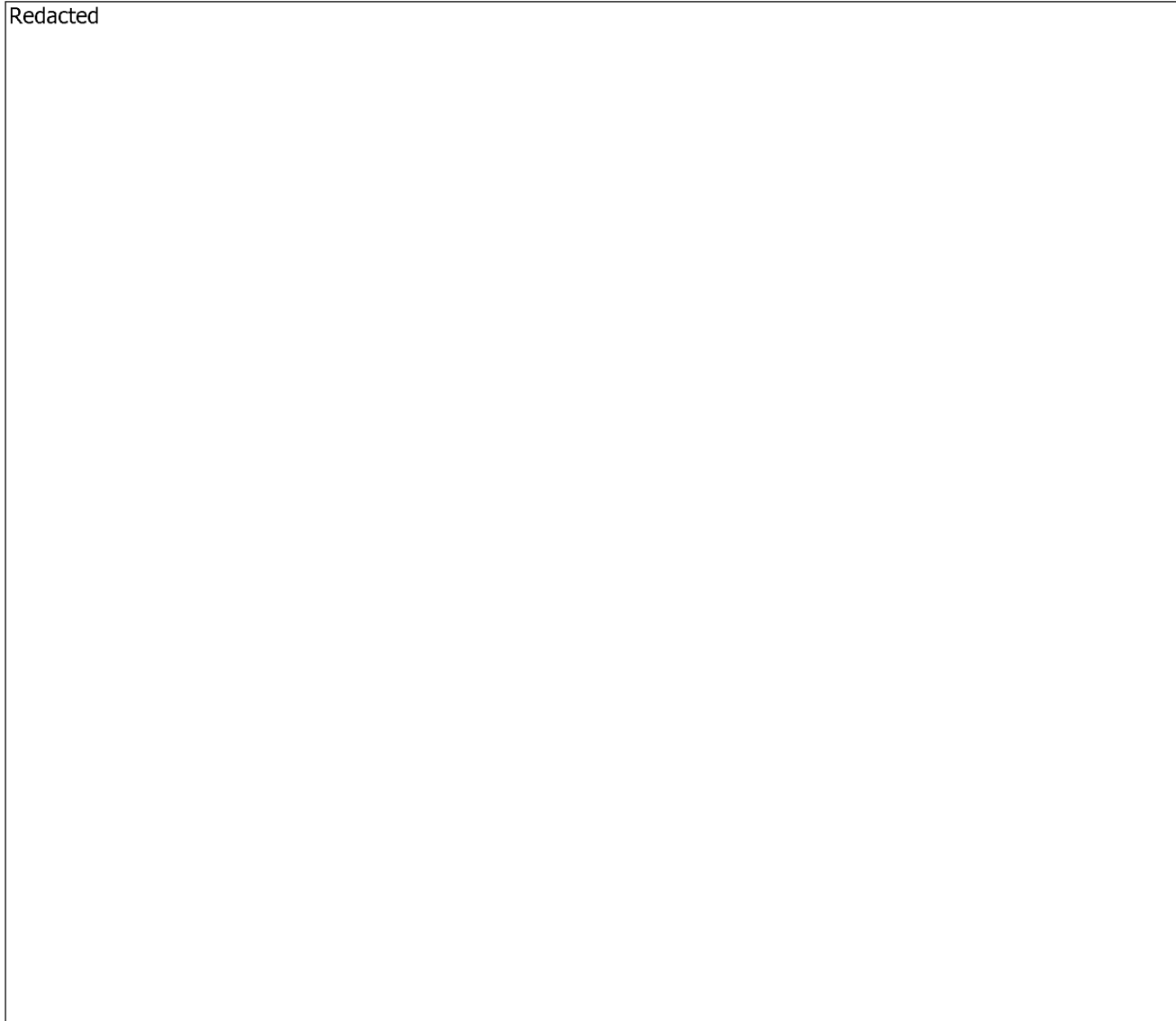
| | Temperature (degrees Fahrenheit) | | | | |
|-----------------------|----------------------------------|--|---|---|---|
| | 47 | 44 | 39 (CWD) | 34.5 (midpoint) | 30 (APD) |
| Temperature Frequency | 19 days per winter, 1 day in Nov | 7 days per winter, ~10% chance in Nov | 1 in 2 years | 1 in 10 years | 1 in 90 years |
| # Customers at Risk | System marginal | Up to ~1,800 residential, one noncore (hospital) | Up to ~12,000 residential, one noncore (hospital) | Up to ~15,000 residential, one noncore (hospital) | Up to ~17,000 residential, one noncore (hospital) |

Customer Outages – 44° F (10 days/winter)

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Customer Outages – 39° F Cold Winter Day (1 day / 2 years)

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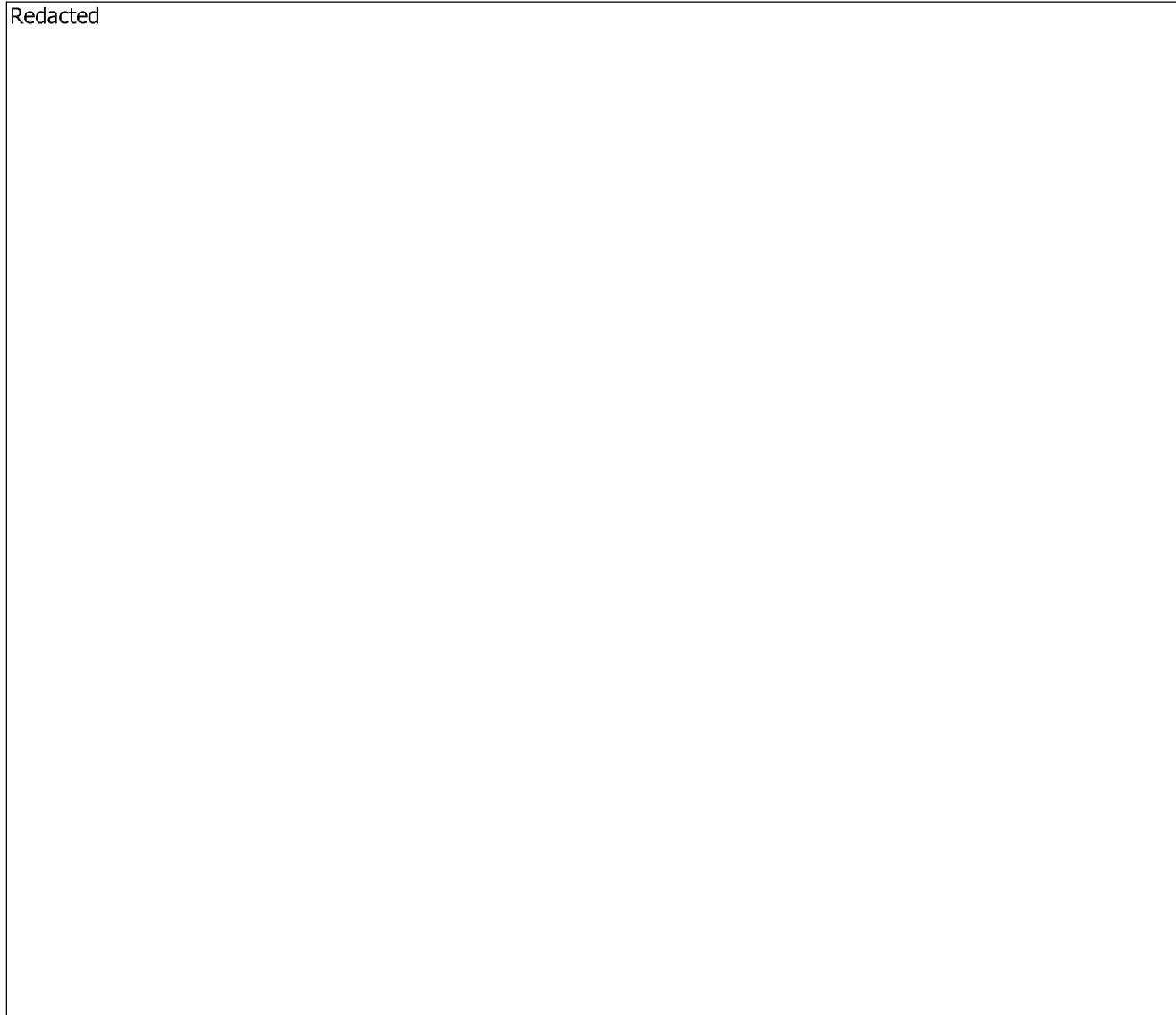


Customer Outages – 34.5° F Midpoint (1 day / 10 years)

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Customer Outages – 30° F Abnormal Peak Day (1 day/90 years)

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Preliminary Distribution System Mitigation Options

| | Temperature(deg F) | | | |
|--------------------------|---|--|---|---|
| | 47 | 44 to 42 | 39 (CWD) | 30 (APD) |
| Frequency of Temperature | 19 days per winter | 7 days per winter (could occur in Nov) | 1 in 2 years | 1 in 90 years |
| Mitigation Options | Possibly draft Line 147 from 125 to 60 psig | Draft Line 147 from 125 to 60 psig | 1 LNG tanker Draft from L147 1600' 6" plastic OR Flow L147 at 125 psig (throttle from L109/132 or install regulation) | 3-4 LNG tankers Draft from L147 1600' of 6" plastic OR Flow L147 at 125 psig (throttle from L109/132 or install regulation) |

Mitigation options are preliminary, additional analyses required.

Peak Shaving Issues

- Siting extremely problematic from feasibility and city/public acceptance
- Availability of equipment and resources uncertain

Peak Shaving Location Issues

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– Lane closure at busy intersection,

residential neighborhood

Redacted

Peak Shaving Location Issues

Redacted

San Carlos – Residential neighborhood, neighborhood objections to regulator station installation at same location

Redacted

Local Transmission System Mitigation Options

- Placing Line 147 back into service at a higher pressure than 125 psig mitigates the following issues:
 - Significant customer outages if an unforeseen event causes Line 101 to be out of service between Line 132A and Line 147
 - Risking significant customer outages to take portions of the Peninsula system out of service in order to continue pipeline safety work