SMUD Gas Pipeline Operations: Emission Reduction Management

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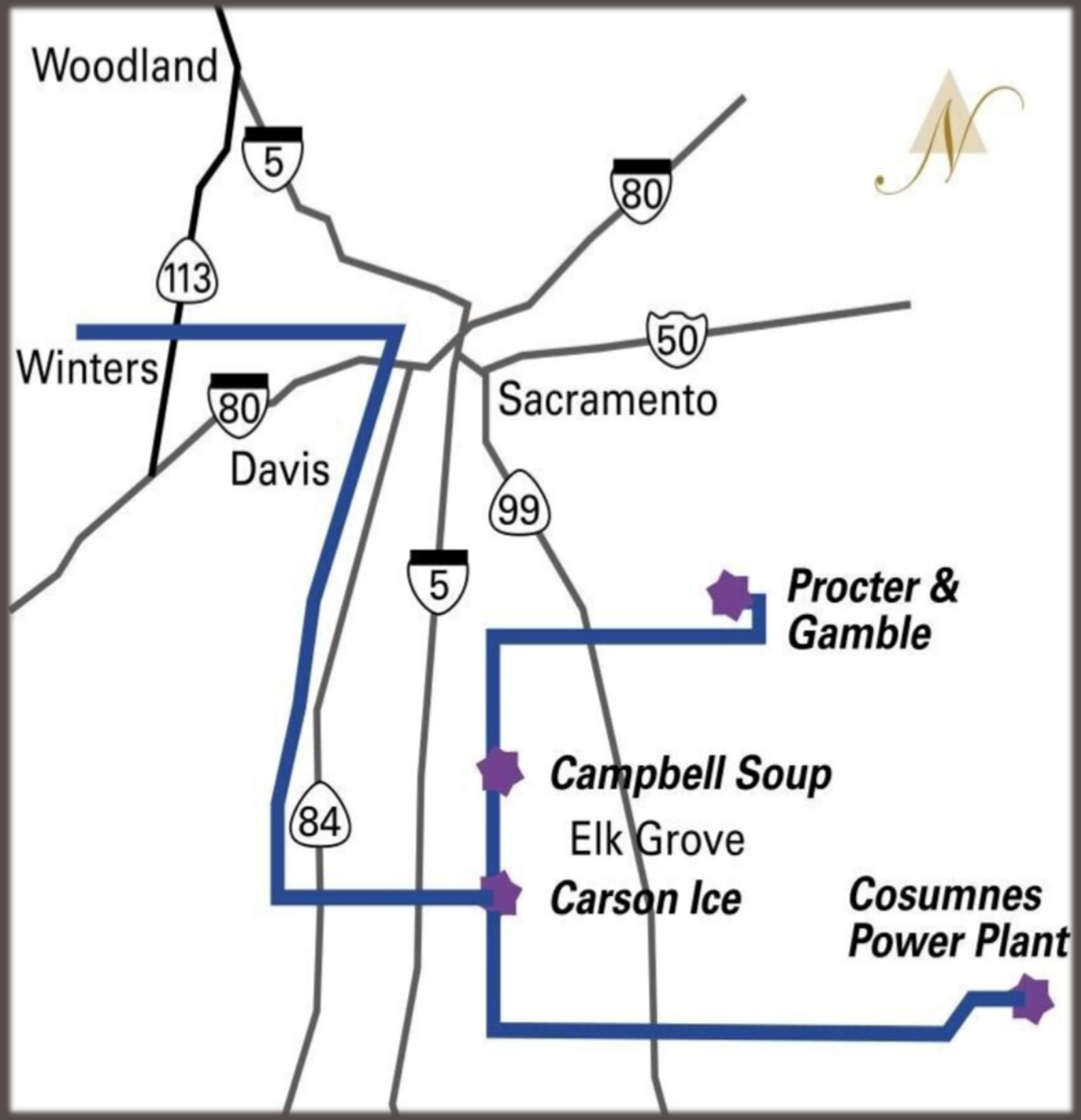


Gas Pipeline Operations

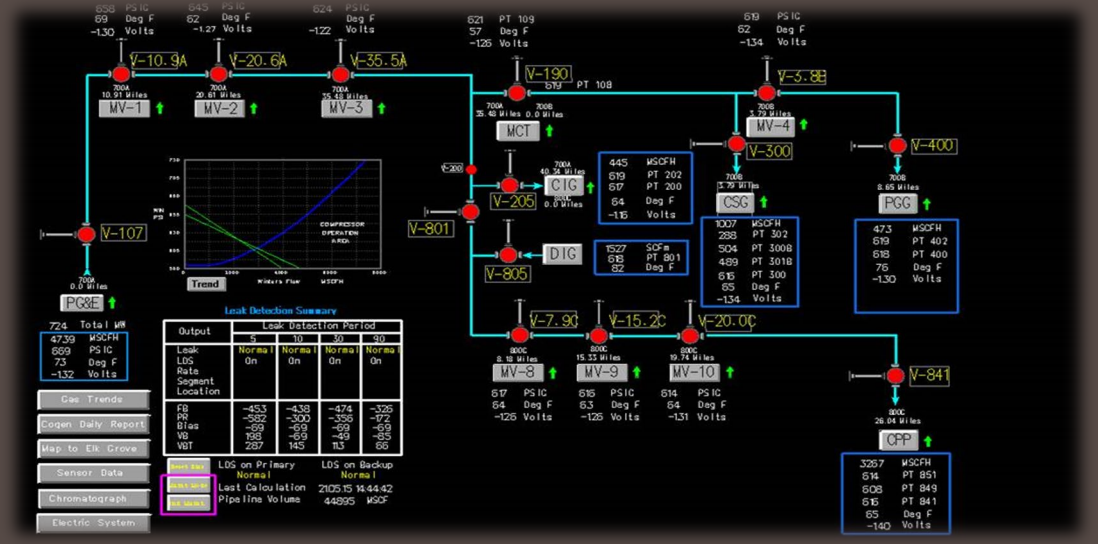
System Overview

SMUD owns & operates 76 miles of high-pressure pipelines located in Solano and Sacramento Counties.

The pipeline system is designed to move approximately 190 million cubic feet of gas per day.

Gas Pipeline Operations

System Operations



- The pipeline is a transmission system without compression, that is remotely monitored and operated.
- Information about the pipeline's operating equipment and parameters is communicated through a Supervisory Control And Data Acquisition (SCADA) System.
- SMUD's system is equipped with a Gas Leak Detection System (GLDS) that constantly checks pipeline volume balance, detects leaks and has remotely controlled shutoff valves that can isolate pipeline segments without sending personnel to the field.

Gas Pipeline Operations

Regulation and Integrity Management

SMUD's Regulators

- Department of Transportation / Pipeline Hazardous Materials and Safety Administration (PHMSA)
- California Public Utility Commission (CPUC)
- California Energy Commission (CEC)

Code

- 49 CFR 192 - Department of Transportation (DOT) Code
  - Part 192 Outlines the Minimum Safety Requirements for Pipeline Facilities and the Transportation of Gas
  - California Public Utilities Commission (CPUC) acts as a state partner with auditing authority under federal guidelines. Reports findings to PHMSA.

Guided By

- ASME B31.8S, Managing System Integrity of Gas Pipelines
- ASME B31.8, Gas Transmission and Distribution Piping Systems
- American Petroleum Institute Recommended Practices

Gas Pipeline Operations

Pipes Act and Implementation

The 2020 pipes act mandated that by 2022 all natural gas pipeline operators would quantify their fugitive emissions, implement an emission reduction program and then quantify the results of their emission reduction program.

Requirements:

1. Study Fugitive Emissions
2. Implement Emissions Reduction Program
3. Quantify Emissions Reduction
4. Adopt Advanced Leak Detection Program (Future)
   A. Suite of leak detection methods
   B. Periodic and continuous

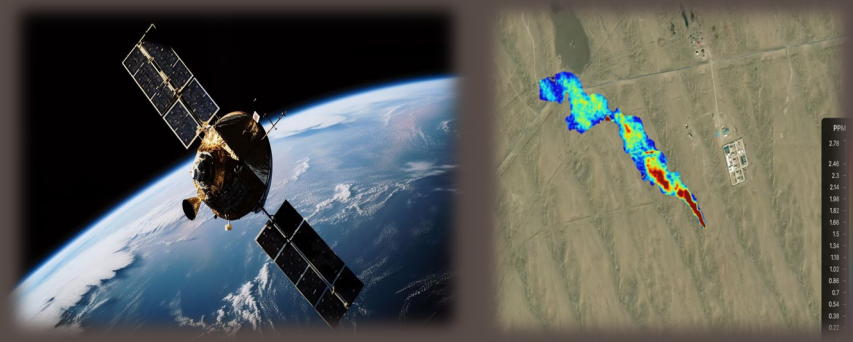
Gas Pipeline Operations

Advanced Leak Detection

Aerial and Ground Based Leak Survey Utilizing
Remote Methane Laser Detection (In use)

Gas Leak Detection Algorithm (In use)

Ultra High-Speed Pressure Monitoring
With AI Leak Detection (In development)



Satellite Methane Plume Detection (In use)
Satellite Leak Survey PHMSA Approval (In development)

Gas Pipeline Operations

Proactive Emissions Reduction

Valve Actuator Electrification

Immediate Leak Repair

Cross Compression

Questions?

Powering forward.
Together.

SMUD®